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DEVELOP A NORMATIVE OR DESCRIPTIVE MODEL OF THE  
INTERNATIONAL/DOMESTIC CIVIL AVIATION INDUSTRY VOLUME 3  
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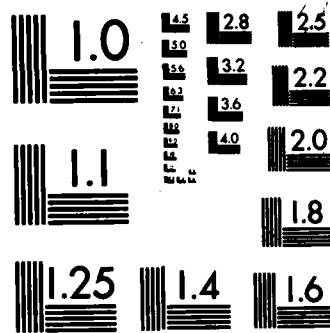
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LETX/Synergy, Inc.  
DEVELOP A NORMATIVE OR DESCRIPTIVE  
MODEL OF THE INTERNATIONAL/DOMESTIC  
CIVIL AVIATION INDUSTRY

Volume 3  
Final Report

September 30, 1982

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Volume 3  
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September 30, 1982

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APPENDIX I

REGULATORY ENVIRONMENT

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## I. Introduction

This appendix deals with the regulatory environment that the civilian air fleet has faced in the past and will likely face in the future. A brief history of the different regulatory agencies involved with civilian air travel is presented first, followed by a more in-depth analysis of the changing regulatory environment brought about by the Airline Deregulation Act of 1978, and its possible consequences on the structure of the civilian air fleet in the future.

The airline industry is currently experiencing a radical departure from historical trends in regulatory activity -- the periodic phasing out of certain aspects of airline regulation, specifically affecting the airlines' operating behavior and subsequently affecting industry structure in terms of airplane mix. The "dust" has not settled from this rapidly changing, evolving new industry structure. However, it is clear that the airline industry of the future will look different from that of the last 10 to 15 years. The discussion below evaluates these trends and provides a perspective for understanding behavioral changes that are occurring in the industry at the present time and are likely to occur in the near future, a subject that receives considerably more attention in later sections of the report.

## II. PASSENGER REGULATION

### A. Federal Aviation Administration

A federal role in fostering and regulating civil aviation began in the

year 1926 with the Air Commerce Act<sup>1</sup> (see Table 1). This led to the establishment of the Aeronautics Branch, later called the Bureau of Air Commerce, located in the Department of Commerce. Authority was given to certificate pilots and aircraft to develop air navigation facilities, promote safety, and issue flight information. In 1958, the year in which American jets entered commercial service, Congress passed the Federal Aviation Act. This Act created the Federal Aviation Agency with broad authority to regulate civil aviation and provide for the safe and efficient utilization of the nation's air space. Eight years later the Department of Transportation Act of 1966 placed the FAA under the aegis of the Secretary of Transportation. This allowed the FAA's functions to be considered in the context of a national transportation policy and allowed for the coordination of transportation modes, a function for which the Department of Transportation was created. Chief among the FAA's policies are the promotion of aviation safety and ensuring the efficient use of the nation's navigable air space. The FAA carries out its responsibilities by issuing and enforcing safety rules and regulations, certificating airmen, aircraft, aircraft components, air agencies, and airports, conducting aviation safety related-research and development, and managing and operating the national air space system.

At the end of 1978 there were almost 800,000 active FAA certificated , including slightly over 200,000 student pilots.<sup>2</sup> Mechanics, control tower operators, and other support services number in excess of 362,000.

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<sup>1</sup> See publication, Federal Aviation Administration, Department of Transportation, available at Public Information Center, Office of Public Affairs, FAA; also DOT, FAA's, The Federal Aviation Administration and its Responsibilities, Speaker's Kit -- SK-2.

<sup>2</sup> Ibid, pp. 2-5, for the following data.

TABLE 1

Development of Federal  
Role in Civil Aviation

<u>Year</u>	<u>Act</u>	<u>Agency</u>
1926	Air Commerce Act	Aeronautics Branch Bureau of Air Commerce
1938	Civil Aeronautics Act	Civil Aeronautics Authority Civil Aeronautics Board
1958	Federal Aviation Act	Federal Aviation Agency
1966	Department of Transportation	Department of Transportation

There were at this time 2,545 air carrier aircraft, 180,000 general aviation aircraft, approximately 1,800 pilot schools, 134 mechanics schools, 2,750 repair stations in the U.S., and 107 overseas. The FAA operates and maintains 25 air route traffic control centers, 428 airport traffic control centers, 21 combined stations/towers, 318 flight service stations, 6 international flight service stations, 99 air route surveillance radar/en route, 180 airport surveillance radars/terminal, 628 instrument landing systems, over 900 navigation facilities, and 534 remote center air/ground facilities. The FAA owns or leases and operates about 67 aircraft of various types, both piston and turbojet, used for training flight standards inspectors for flight testing, air navigation facilities, R&D purposes, and administrative needs. Of the 4,751 publicly-owned airports in the United States, 3,000 are included in the National Airport Systems Plan, and of these 847 serve both airline and general aviation activity. For these 3,000 airports, the FAA develops the NASP which identifies and forecasts airport development improvement projects required to accommodate aircraft safely and efficiently.

The FAA operates about 10,000 navigational aids to provide pilot guidance and location information over the 351,564 miles of the federal airways system. FAA inspectors fly over 70 million miles a year monitoring the airways aboard a fleet of specially equipped FAA aircraft. The FAA has primary responsibility for the safe operation of 195,000 civil, military, and international aircraft. The civilian air fleet, part of this system, ranges from multi-engine jet transports to small sports aircraft and also includes helicopters, balloons, blimps, and gliders.

The FAA has designated more than 6,000 physicians as aviation medical examiners who conduct periodic physical examinations on the approximately

800,000 active FAA pilot certificates. Mechanics, parachute riggers, ground instructors, aircraft dispatchers, flight navigators, and engineers are also included in the category that must take physical examinations and be licensed for their occupations by the FAA. Finally, the FAA is also responsible for developing and enforcing the rules that govern safety in civil aviation. Their certification processes include standards for aircraft air worthiness, flight crew members and other airmen, operating requirements for air carriers, air taxis, agricultural crop dusters, air traffic rules, rules for air space utilization, etc.

## B. Civil Aeronautics Board

### 1. Domestic Activities

The Civil Aeronautics Board (CAB) is the outgrowth of the Civil Aeronautics Act of 1938 which established the independent Civil Aeronautics Authority with responsibility for both safety and economic functions. In 1940 the Civil Aeronautics Administration was created, which was placed under an Assistant Secretary in the Department of Commerce and a semi-independent Civil Aeronautics Board, and which reported directly to Congress but had administrative ties to the Department of Commerce. The CAB has had many functions in the regulation of air transportation. These functions have affected both the structure of the industry as it has evolved over time and the day-to-day operating behavior of the individual airlines. In terms of industry structure, the CAB controls entry and exit from the industry by its authority to grant route certificates to individual airlines and to require the continuation of service to particular communities where strict financial considerations might not warrant the operation. This latter function is guaranteed through the use of a subsidy program. By its control of entry and

to institute new services at new gateways over a six-year period. However, the Bermuda II agreements also provided some difficulties for U.S. carriers. Sensing discontent, a new international policy began to emerge -- one that focused on liberalizing that portion of the airline industry rather than restricting it. This approach allowed marketing and pricing flexibility and in exchange offered new U.S. gateways to foreign carriers.

### C. Department of Transportation

The Department of Transportation has responsibility for developing an overall transportation policy and implementing that policy with the cooperation of other agencies and departments. The DOT is a primary partner in developing the international bilateral agreements for air transportation between the United States and foreign countries. It does this in coordination with the CAB and the Department of State. It also oversees the functions of the FAA and provides the mechanism for coordination of air transport policy with other transportation modes' policies within the United States.

### III. FREIGHT REGULATION<sup>4</sup>

Direct air carriers, air freight forwarders, and various types of surface carriers, the principal participants in the air cargo industry, have been subject to control in their operating authority by the Civil Aeronautics Board and by the Interstate Commerce Commission (ICC). In varying degrees, some price regulation has also been imposed on the industry by these agencies. Controls over entry and pricing have been of primary importance in determining the shape of the industry. Under the Federal Aviation Act of 1958, common

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<sup>4</sup> Much of the information presented here was taken from Lucille Sheppard Keyes, "Regulatory Reform in Air Cargo Transportation," American Enterprise Institute, 1980.

exit, the CAB largely determines the number and size distribution of not only airline companies that operate within the industry but also the relative mix of different kinds of aircraft. Thus, they have impact on aircraft manufacturers.

In cooperation with the FAA and other federal agencies, the CAB also has some impact on the cost structure of the airlines, and in cooperation with the FTC and Department of Justice effects the vertical integration and the degree of conglomeration within the industry. Aside from the safety aspects of air transportation which are largely controlled by the FAA, the CAB concerns itself more with the economic interrelationships and the development of the industry from an economics perspective than does any other agency of the Federal Government. In addition, the CAB is responsible in large part for a major aspect of the operating behavior of the airline industries, namely pricing. Fare changes have up until recently required CAB approval, as did other activities which constitute the day-to-day operating behavior of the airlines.

In controlling pricing, the CAB also had, until recently, significant impact on the performance of the airlines. Certainly, the areas of productive and allocative efficiency, the CAB's oversight of passenger load factors, bumping rules, overbooking allowances, etc. had a significant impact on the operating behavior and performance of individual airlines. In a normal market an industry's operating behavior and performance would affect the structure of the industry. However, up until the Airline Deregulation Act of 1978, the CAB seemed to control all aspects of the development of the industry. They did not have to be concerned with the feedback effects of their pricing policies on industry structure nor the impact of performance on industry structure

since they controlled the industry structure themselves.

## 2. International Activities

In the area of U.S. international aviation policy, the CAB has also played a very strong role.<sup>3</sup> A triad, including the Department of Transportation, the Department of State, and the CAB have been responsible for negotiating agreements for international travel between the U.S. Government and foreign governments. These bilateral agreements serve to reduce discrimination that might exist against U.S. carriers on the part of foreign governments in an effort to strengthen their own domestic carriers (in a competitive sense). However, quiet diplomacy, usually conducted by the carrier itself, has in the past been a more useful approach than invoking straightforward retaliatory actions on the part of the U.S. Government. Since the postwar period, the U.S. had negotiated these bilateral agreements from a position of world dominance. An initial set of agreements called the Bermuda I agreements authorized the designation of U.S. carriers to serve from the United States to specific ports in foreign countries. Authority was enjoyed by our carriers to operate and carry local traffic between foreign countries. However, U.S. carriers lost market share to growing European carriers throughout the period 1970 to 1977 because of the general increased competitiveness of foreign carriers.

In 1976 the U.K. denounced the Bermuda I agreement on the grounds of imbalanced benefits. From these renegotiations the U.S. lost its absolute right of multiple designation. Flight privileges out of the U.K. and Hong Kong were restricted severely. However, in return, the U.S. gained the power

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<sup>3</sup> See Statement of Marvin S. Cohen, Chairman, CAB before the House Committee on Public Works and Transportation, Subcommittee on Investigation and Oversight, August 4, 1981.

carrier interstate air transportation requires CAB authorization, either by a certificate of public convenience and necessity or by administrative exemption. Before 1977 reform legislation, certificated all cargo carriers were also confined to specific routes and exclusively limited to the carriage of cargo, not passengers. Direct air carriers were allowed to carry passengers as well as cargo, but until recently their total payload could not exceed 7,500 pounds (recently changed to 18,000 pounds by the CAB). Air freight forwarders cannot engage in direct air carriage, that is, they cannot operate aircraft without additional specific authority, although they can charter in interstate air transportation. These charters may be obtained from supplemental as well as route-type carriers. Joint loading, where two or more air freight forwarders assemble their freight under one designated forwarder or shipper, has been permitted since 1955 for charters.

Air carrier participation and surface carriage is limited by the Pick Up and Delivery service (PUD) regulations under the aegis of the CAB and ICC. The general confinement area of a 25 to 50 mile radius of the point of origin or termination of air carriage was changed to 25 to 35 miles in the spring of 1979. Direct air carriers may also contract with ICC certified surface carriers to provide pickup and delivery services beyond the PUD zone or to provide substitute service on routes where the air carrier has direct air operating authority. The service, however, has been restrictive. Up until recently, surface transportation had to be supplied at ICC-specified common carrier rates, and these rates have been insufficient to enable truckers to provide the expedited services that the shippers of freight by air require. In addition, CAB rules governing substitute service have required that the service be provided only between points where some air service is being

offered and it has to be accompanied by prior and subsequent air movement.

Air freight forwarder participation in surface transportation is generally subject to the same limitations that apply to direct air carriers. However, an exception is United Parcel Service which is a large air freight forwarder but has obtained extensive trucking authority from the ICC as a surface freight forwarder. Until recently the purpose of the certification has been to protect existing operators from excessive competitive inroads on their revenues. The certificates stake out territories within which carriers enjoy protected status.

Although trunk, local, and all cargo airlines have been subject to price regulation since 1938, commuter carriers have been exempted and air freight forwarders also exempted from price regulation, although they must file and adhere to tariffs and refrain from discrimination.

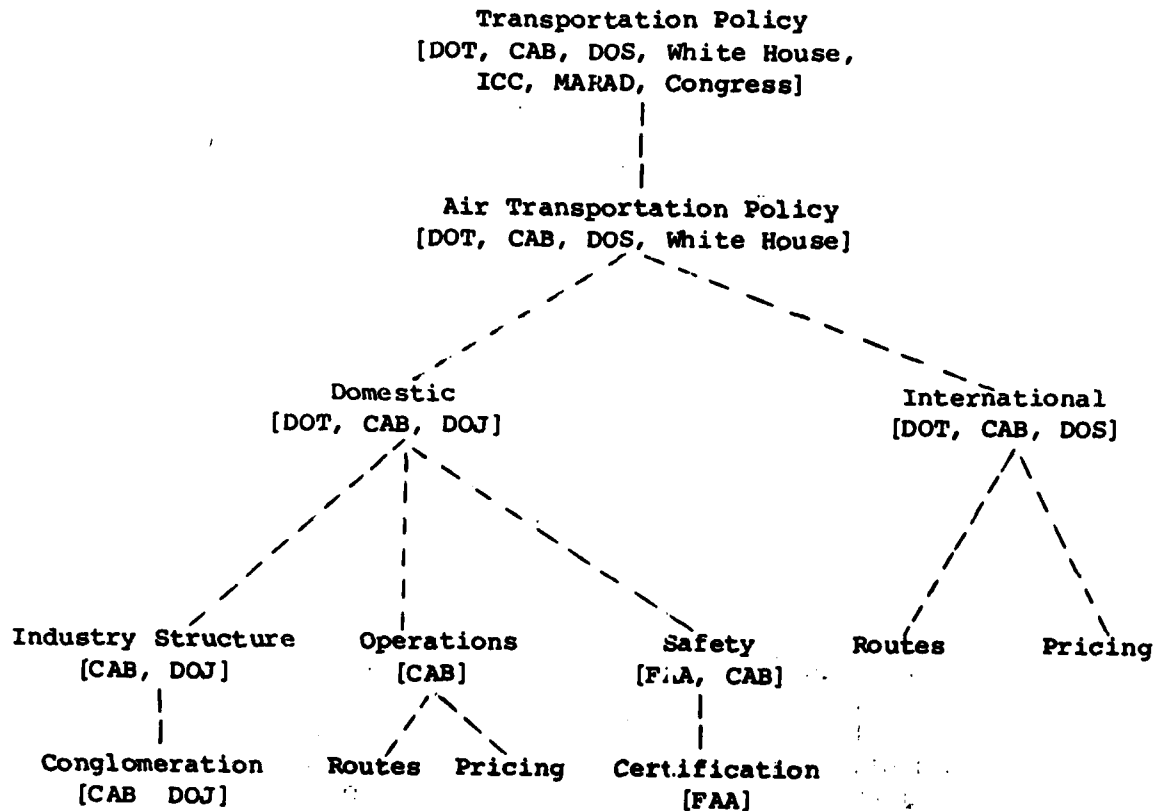
#### IV. INTERRELATIONSHIPS IN REGULATION

In the past, the division of regulatory responsibilities between the various agencies involved in air passenger and freight transportation have been fairly clear. The FAA had prime responsibility for air traffic safety and the day-to-day operation of the system. The CAB was more responsible for the economic characteristics and the development of those characteristics over time within the aviation system. The Department of Transportation in general and the Department of State, in conjunction with these other independent agencies, focused most of their attention on overall transportation policy and interrelationships of the development of the U.S. air fleet with international markets and governments (see Exhibit 1).

In the past there has been little overlap in functions and responsibilities between these government entities, at least to the extent

EXHIBIT 1

Flow of Government  
Involvement in Air Transportation



Legend:

DOT	-	Department of Transportation (includes FAA)
FAA	-	Federal Aviation Administration
CAB	-	Civil Aeronautics Board
ICC	-	Interstate Commerce Commission
MARAD	-	Maritime Administration
DOS	-	Department of State
DOJ	-	Department of Justice

where major frictions and differences of opinion have resulted in divergences in overall policy. Indeed, if one were to attach a chronology to the impact that the regulatory agencies have had on the industry, the prime mover would be the CAB. It is the CAB that has the power to alter the structure and operating behavior of the industry through its restrictions on entry and exit from particular markets and restrictions on fares. Once the overall structure has been developed and the airlines and aircraft manufacturers respond with a particular mix of airplanes, it is the FAA's responsibility to guarantee safety in travel not only in a development sense for the airlines but on a day-to-day operational sense, on a continuing basis.

Each regulatory agency and its oversight of passenger and cargo travel has been significantly affected by the recent moves to deregulate the airline industry. In some cases the deregulation environment has fostered or is beginning to foster a change in the responsibility of specific agencies and departments. In other cases it is clear that the deregulatory environment will reduce the future input of these regulatory agencies and in some cases be a significant force in guaranteeing their abolition. Ignoring for the moment the impacts of increasingly higher fuel costs, economic recession, and other world trends on the future development of the airline industry and subsequent mix of airplanes in service, the section below focuses solely on the impacts of the deregulatory environment on the future of the airline industries.

#### V. DEREGULATION IN THE AIRLINES

A number of regulatory actions have been taken in the last few years that have brought about a general state of deregulation or anticipated deregulation in the airline industry. This environment applies to both passenger travel domestically, cargo shipments, and international travel. Below, each of these

areas of air transport is evaluated in the context of a deregulation environment. A major purpose of this discussion is to provide a framework within which future outyear projections of aircraft mix can be made, given the new environment (see Table 2).

A. Passenger

1. Domestic

a. Initial Action

After four years of legislative hearings and debates initiated during the Ford administration, President Carter signed into law the Airline Deregulation Act of 1978 in October of that year. The two major components of that Act were that at the end of 1981 the Federal Government would cease telling airlines what markets they could serve, and on January 1, 1983 the government would no longer tell airlines what to charge. The major provisions of the Act that took effect immediately included the following:

1. A shift of the burden of proof in route authority cases from the need for a public showing that entry meets public convenience and necessity to a showing by opponents that entry is inconsistent with public convenience and necessity;

2. Provision for a limited degree of automatic entry which required no CAB review or approval;

3. Allowance of carriers to apply for and obtain dormant route authority -- that is, authority that was not being used by the airline holding the particular certificate;

4. The setting of a statutory zone for reasonableness for fares;

5. Provision for a new essential air service program intended to replace local service subsidies and established procedures for airlines wishing to

## Major Functional Responsibilities

## Pre-Deregulation

terminate service at specific communities to the degree these provisions ratified steps that the CAB had already taken in liberalizing pricing and entry for existing certificated carriers. However, the specific action protected the Board's policies from court challenge and guaranteed that no future changes by the CAB could reverse this general course of deregulation.

These provisions made rapid entry possible and opened the opportunity for the first time for airlines other than trunks and local service carriers to obtain certificated route authority. In a sense, entry since that time has been virtually unrestricted. Indeed, in early 1979 the Board adopted a policy of open entry, that is, allowing carriers to enter new routes as a matter of business judgment for all fit carriers, approximately three years ahead of the statutory requirement for the elimination of economic route regulation.

b. Recent Sunset Initiatives

As recently as July of 1981 in a statement by Marvin Cohen, former Chairman of the CAB, before the Senate Subcommittee on Aviation, a number of new legislative proposals were brought forth. To briefly summarize the Board's new proposals for changing the regulation of air transportation, the following were proposed:

1. Elimination of air carrier certificates issued by the CAB for domestic transportation and allowing the FAA to assume the full responsibility for ensuring that carriers provide safe transportation;

2. Eliminate the CAB's and any successor agency's approval authority over mergers, acquisitions and interlocking relationships and replace it with authority to intervene in antitrust cases in the courts;

3. Transfer of the authority to approve and immunize carrier agreements to the Department of Transportation rather than the Department of Justice as

presently provided in the Airline Deregulation Act of 1978, and repeal such authority for domestic transportation on January 1, 1986;

4. Transfer to the Department of Transportation the CAB's authority over the carrier's duty to provide safe and adequate service.

An earlier proposal sent to Congress, which was part of the present Bill, would repeal the Section 406 subsidy program which the Board feels is unnecessary in view of the now fully operating Section 419, Essential Air Service and Compensation Program. In addition, the CAB would transfer its authority to collect information and reports to the Department of Transportation and would revise the federal preemption provision to reflect an elimination of Board certificates to continue to bar states from regulating interstate carriers and operations, except for those that have a minimum involvement with interstate transportation. Further, the Board's proposal would change the preemption provision, ensuring that in the exercise of proprietary rights, carrier access to airports is not unreasonably denied by airport operators. The CAB's proposal also recommends changes to the Federal Aviation Act to reflect the various transfers and repeals and to provide for an orderly transition in functions and an orderly shutdown of the CAB.

As recent as October, 1981, the Senate Commerce Committee staff was in the process of drafting early sunset legislation for the CAB. According to that draft legislation the CAB would cease to exist by April 1, 1983, but could be phased out as early as January 1, 1983 if both the CAB and the Department of Transportation agreed on that timetable. There were various other provisions of the sunset legislation including the following:

1. Mandatory joint fares would continue until January 1, 1986. The current formula for dividing the joint fares, however, would be eliminated

July 1, 1984, and commuters and the larger airlines would then negotiate the division.

2. Authority to grant antitrust immunity for interline agreements would be transferred to the Department of Transportation before ending completely on January 1, 1986. No new agreements would receive immunity after April 1, 1983, except for amendments to older agreements.

3. Section 406 subsidy levels would gradually decrease from \$28 million in FY82 to \$7 million in FY85.

4. Airline reporting requirements would be reduced to a minimum. The government's ability to investigate carrier management under Section 415 involving international aviation would also be limited.

5. Anti-discrimination rules would be enforced by the Justice Department instead of the CAB. Private citizens could not bring their own discrimination suits against the airlines but would have to go through their local U.S. attorney.

6. Airlines would not be required to carry mail. The Department of Transportation would oversee contracts for carrying international mail and the U.S. Postal Service would negotiate contracts for domestic mail. Foreign carriers could be used if no U.S. carriers were available to carry mail.

7. CAB authority over airline mergers would be repealed April 1, 1983. Mergers within the industry would be handled as they are in any other industry, by the Justice Department.

8. The Federal Trade Commission would have responsibility to oversee consumer affairs functions now performed by the CAB.

9. Control over international affairs would be transferred to the Department of Transportation where requirements to approve all international

fares that are not so low that they are deemed predatory and that are within a zone of upward flexibility determined by the government would be controlled.

10. No separate agency within the Transportation Department similar to the functioning of the Federal Aviation Administration would be initiated to handle former CAB functions.

11. CAB responsibility for determining the employment impacts of deregulation are transferred to the Department of Transportation. Financial aid to such employees continues.

12. The legislation includes no provisions for publishing tariffs or fares.

## 2. International

A new international policy has begun to emerge and focuses on the exchange of liberalizations instead of restrictions in international air travel, different from the Bermuda II model which focused on limited gateways, capacity controls, loss of flight privileges and rigid prices. The more liberal approach allows marketing and pricing flexibility and offers foreign carriers new U.S. gateways. Up until August of 1981, the U.S. had entered into 19 new air transport agreements under these liberalized guidelines. They vary in the degree of their competitive freedom across different countries. The elimination of discriminatory practices that U.S. carriers have endured for many years has been a major focus of this effort. Consumers have benefited from this liberalization approach. The success of the Laker Sky Train and other liberal agreements put pressures on Great Britain and Europe to reduce other restrictive practices. For the first time ever, North Atlantic service became responsive to the needs of vacation travellers, in addition to government employees, business executives and the wealthy. The

most important benefit of this new competitive aviation policy is found in the wide range of competitive prices and services available to the flying public and increased international services, not only at existing gateways but at new interior gateways in the United States.

#### B. Freight

The proposal to reform air cargo regulation was passed in November of 1977. For all intents and purposes, it took effect immediately. It is not the purpose here to trace the long line of interactions that led to the final proposal for the liberalization of air cargo transport.<sup>5</sup> By brief review, however, the new law allows for open entry after a brief period of time, limited price control and immediate expanded authority for some of the existing participants. Although all issues regarding air cargo reform legislation have not been settled, it is instructive to survey the probable future impacts as well as immediate post reform developments resulting from this action.

Domestic air freight traffic in 1978 was 26 percent higher than it had been in 1977. This is in contrast to a 10 percent annual growth rate over the period 1969-1977. Indeed, freighter capacity operated by trunk lines and the all cargo carriers was 21 percent higher in 1978 than in 1977. With the addition of new air transport equipment, Federal Express in 1978 handled shipments 38 percent higher than it had handled in 1977. For all cargo commuters as a group, shipments in 1978 were almost 34 percent above 1977. During a one year grandfather period, 74 carriers received all-cargo

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<sup>5</sup> For a detailed account of the content of this legislation, see Lucille Shepard Keyes' Regulatory Reform and Air Cargo Transportation, American Enterprise Institute, 1980, Chapt. 2, pp. 22-39.

certificates, including ten trunklines, three all-cargo carriers, 52 air taxis and nine supplementals. After November 1978, and in an environment of general open entry, 29 new applications were made to the CAB. Most came from freight forwarders and contract carriers. However, a few were newcomers to the air freight business. Furthermore, in the midst of this additional capacity, there were complaints in mid-1978 of still remaining insufficient freight capacity.

General freight rate increases occurred in 1978 and 1979, contrary to some general price reductions that had been hoped for with the advent of deregulation. However, it seems that actual freight rate levels in this post-regulatory period were well within the bounds of what would have been permitted under continued regulation, since costs did increase significantly in the period 1977 through 1979. In addition, the deregulation period allowed experimental pricing to take place with a much greater ability to alter experimental prices when found to be unprofitable. The CAB has acted to expand the authority of air freight forwarders and shippers' cooperatives and to permit the same company to operate both as an all-cargo certificated carrier and as an exempt commuter. The CAB has not allowed direct air carriers to pay commissions to forwarders on shipments tendered by them but has opened the possibility that the forwarders could be paid for a ready-for-carriage fee which would amount to the same thing. The CAB has campaigned against the ICC in an effort to expand the PUD zone to a more flexible limit that would permit air carriers to perform all-surface carriage that was incidental to transportation, at least be set at a 100 mile radius.

## VI. FUTURE ENVIRONMENT

It would appear at this time that the future regulatory environment will consist of the following: (1) the elimination of the CAB, and (2) the FAA's oversight of safety and air transportation and the DOT in general responsible for bilateral agreements for international air travel, the collection of routine data, and general aviation policy developments (see Table 3). Within that regulatory environment there may be a change in the structure of air service. In order to understand the evolving structure of air service, it is necessary to have some understanding of the arguments made for and against deregulation in air passenger service.<sup>6</sup>

### A. Advocacy of Deregulation

Proponents of deregulation point to the falling real cost of air travel immediately following deregulation as well as a high rate of growth in traffic, expansion of air service, and high airline profits as indicators of success of deregulation. The rather sudden deterioration in service and profits that occurred in the last quarter of 1979 and throughout 1980 were caused by rapid rises in fuel costs, a strike within the industry, and general recessionary trends throughout the economy that affected airline service demand.

Proponents of deregulation claim that pricing and entry freedom has caused four major developments in the industry that has substantially changed the

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<sup>6</sup> It is not the purpose here to become involved in a controversy over the advantages or disadvantages in air transport service of deregulation. It is sufficient to highlight the arguments of the proponents and opponents of deregulation and to suggest the future structure of air transportation given the deregulatory environment. It is also sufficient to suggest the impact of deregulation on future airline behavior without a detailed analytical evaluation of the dynamics of that behavior. That important topic will be addressed in detail in a later section of the report.

TABLE 3

Major Aspects of Future  
Regulatory Environment

- .... Termination of all CAI functions.
- .... FAA total responsibility for safety and efficient use of air space.
- .... DOT-DOS responsibility for international agreements.
- .... DOT responsibility for data collection.

structure of the industry. These developments include:

- 1) Discount fares which are targeted at discretionary travelers and shift such traffic to off-peak hours of the day.
- 2) A closer match of the quality of service and air fares with market demands.
- 3) Substantial entry by trunk and local carriers into new routes and the rapid growth of commuter airlines to replace some major carriers in the smaller communities.
- 4) The growth of low-cost airlines, including the former intrastate airlines (such as PSA) and the new entrant airlines.

These developments have, proponents claimed, made the airline industry more efficient and better able to provide the amount and quality of service that is demanded by travellers. Indeed, the proponents of deregulation claim that productivity and service changes under deregulation significantly improved the condition of air travel. Specifically, the growth rate of airlines with lower costs have increased relative to the growth rates of other airlines. Local service carriers have expanded into longer-haul markets in an effort to provide their passengers with single carrier service. In many markets of less than a thousand miles, local airlines' aircraft provide service at a lower cost than the three-engine equipment commonly used by the trunks.

The new entrants into the industry have been the fastest growing segment since the passage of the Airline Deregulation Act. Their provision of no-frill service in relatively dense markets has given them a competitive advantage over existing carriers. Although trunk airlines made some strides in terms of productivity gains in the post-regulatory environment, their major problem was their accumulation of a stock of aircraft in the regulated regime that were poorly suited to the economic events that followed deregulation. Their few, efficient aircraft coupled with the increase in the price of fuel

during 1979 and 1980, increased their costs more than costs for the local service carriers. In addition, they accounted for a large percentage of the wide-bodied aircraft which are only fuel efficient if used to provide service in dense long-haul markets. As industry demand declined, the number of markets where wide-bodied equipment could efficiently be used, also declined. Thus, with an excess capacity of the wide-bodied equipment, the fares in these long-haul markets could not rise enough to cover rising costs. To a significant degree, the deterioration in trunk airlines' profit has been due to their inefficient fleet mix. One of the first effects of deregulation and the resulting fare and route flexibility was to allow airlines to make better use of existing aircraft. They were able to provide a given level of service with a smaller fleet of aircraft. They have already been deemphasizing secondary hubs and focusing more activity on primary hubs. The convenience of service at these medium hub communities has declined on average but some smaller hub communities are getting more direct service to the principal hub rather than through the medium hubs. Non-hub markets have actually increased the number of airflights since deregulation.

At the present time, the non-hubs are receiving about the same number of departures as they had in 1977. While some communities have lost service and others have gained, there is no overall pattern of abandonment of service to communities of any size. The smaller communities that used to be served by multi-stop flights which have declined sharply since deregulation are now obtaining commuter service which is often better timed and more direct than the commuter service that had been replaced.

#### B. Opposition to Deregulation

In general, opponents of deregulation claim that the deregulatory

environment has led to cutthroat pricing and severe adverse financial impact upon the individual airlines as well as the deletion of many routes that were less than profitable under the regulation and have now been abandoned, therefore causing severe cuts in service to many communities.

Three of the common arguments raised against deregulation include the fact that deregulation will: (1) lead to monopoly in the industry, and (2) destroy the integrated airline network and cause cutbacks in service to small communities, and, (3) it would permit destructive competition which would financially destabilize the industry. Opponents of deregulation feared that a few airlines would grow to dominate the industry and deregulation would reduce competition. However, many studies show evidence that the airlines do not exhibit economies of scale and therefore there's no reason to expect that larger airlines will dominate smaller airlines in a competitive environment. In fact, the present trend seems to be toward less concentration. Smaller airlines tend to be growing faster than the larger ones. There is no indication that an oligopoly or monopoly situation is developing in the industry. The development and exercise of monopoly power in individual markets is also a claim made by opponents of deregulation. They fear that the large airlines would set fares that substantially exceed the cost of service in markets where their competition was weak. However, new and established airlines have been very active in entering markets since deregulation. There are not substantial barriers to entry in most markets and potential competition is disciplining airlines' pricing and servicing decisions.

Opponents to deregulation claim that deregulation would destroy the integrated airline service network and cause the abandonment of service to small communities. Regulation permitted cross-subsidizing of service in

unprofitable markets by the profits earned in other markets, and once competition was introduced, unprofitable markets would be dropped. However, the adequate service provision of the Board's certificate of authority had little or no direct influence on the service provided small communities by deregulated airlines. Indeed, the air service network has become more integrated under competition. Fewer trips today require connections than in 1978. Of those that require connections, a greater share now are made with a single airline. There is a shift of connecting service from secondary hubs to major hubs. Many small communities are getting more direct service to their ultimate destinations. Indeed, there is no tendency toward abandonment of small community air service. Although trunk and local airlines have deleted service to some cities, commuters have replaced them. Their service has been judged to be better timed and more direct than the trunks or local service airlines have provided in the past. The subsidies that are spent for these small cities cost the taxpayer less than they have in the past.

The third major concern of opponents to deregulation was that it would cause destructive competition and financially de-stabilize the industry. Prices would fall below out-of-pocket costs on competitive routes and losses earned would drive weaker airlines out of business. There have been fare wars and fares in many cases did not cover fully allocated costs, but these fare wars have been primarily in the long-haul markets, while in most other markets long-run costs have been covered.

#### C. Long-Term Consequences

An indication of some optimistic outlook for the industry in the long run had been the large purchases that had been planned for the new fuel-efficient aircraft. Trunks and local airlines had until recently more aircraft on order

than at any time since 1976. It is clear that at this point in time the "dust" has not settled from the deregulation move. The system is in the process of dynamic change with a restructuring of the mix of aircraft and the service of all markets. It will be some time before it becomes clear what the future structure of the industry will be but some trends caused by the deregulation environment seem to be clear. They include the following:

- 1) The future number of competitive airlines may increase from somewhere in the range of 16 to 20 at the present time to 40 to 50 in the future as the smaller airlines forge into longer-haul markets in direct competition with the trunks and local service carriers.
- 2) There may be a change in the mix of the fleet, primarily to the use of more fuel-efficient, short-range, large-capacity aircraft. Whether or not larger more-fuel, inefficient aircraft will be eliminated from service will depend upon the financing aspects of replacement cost and appropriate capital availability, engine retrofit, and incurrence of extended fuel costs in order to save capital outlay.
- 3) Long-run real costs of air travel will probably decline as markets become more competitive and air travel in general increases in demand.

APPENDIX II  
ASSOCIATION FRAMEWORK

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## ASSOCIATION FRAMEWORK

### INTRODUCTION

This report describes the association framework that exists within the airline and aircraft manufacturing industry. There are a large number of associations that deal in some way with the airline industry. However, only a few engage in functionally significant interactions with other aspects of the airline industry, for example, the regulatory environment. Since most organizations provide specialized services for their members, and since most of these services are tangential to the central focus of this study, these other organizations will receive no attention in this report.<sup>1</sup> Only those associations that have impact on the airlines that are important to the objective of this study will be discussed below.

There are four associations that are of primary importance for this study. They include the Air Transport Association, the Aerospace Industries Association, the International Air Transport Association, and the International Civil Aviation Organization. These four associations are discussed individually in detail below. The interaction of these associations, not only with other associations but with governments, airlines, and aircraft manufacturers, is also described. Before describing each association's operations, a brief section on the effectiveness of associations is provided.

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<sup>1</sup>Appendix A presents a listing of all associations and support organizations that are involved in airline industry activities.

## EFFECTIVENESS OF THE ASSOCIATION FRAMEWORK

The associations described above are most influential on the "supply side" of the airline industry. Many other associations that deal with demand and the passenger or cargo side of the industry have not received attention here because of the relatively small role that they play relative to these major associations. It is not an easy task to describe the effectiveness of these associations and certainly not easy to attach quantitative measures to their effectiveness. However, it is possible to make some qualitative judgements about their efforts and to describe the proper perspective from which associations might be judged, not only in their past performance but in the future changing environment in which the airlines will operate.

In order to understand the effectiveness of an association within the airline industry, it is important to have a clear understanding of the purpose for establishing an association (whether it be in the airline industry or any other industry). An association is no more than a centralized collective storehouse that serves information transfer functions within a particular industry. It is a relatively inexpensive means of collecting industry-wide information and provides a collective or joint forum for expressing individual airline's ideas on certain issues. For example, in the area of legal issues, the cost for each individual airline to employ lawyers to evaluate a particular situation and to present their case to a representative public agency, Congress, or the Administration is much more expensive than having a team of lawyers centrally located in an association that responds to the needs and desires of each individual airline on a collective basis, formulates an industry position and presents that position to the appropriate public body. An association is the natural outgrowth of an efficient market pricing mechanism for the services that are needed by individual firms.

The association itself has no more power than the collective power of each individual airline. However, it provides an inexpensive means of expressing that collective power. It is important to understand that an association does not have an independent or autonomous governing body from which decisions are made about issues. Associations are not independently functioning organizations. They do not of their own volition have particular interests. Rather, they represent industry positions -- positions that are the collective positions of individual firms within the industry.

If it were possible to quantitatively determine the effectiveness of an association and its impact on a particular issue such as fare structure, routes, safety, etc., it would still not be possible to distinguish that effectiveness in a manner different from the effectiveness of individual companies. Thus, it is fair to say that if the industry were able to affect fare structure, it is the individual firms within the industry that are affecting fare structure, and that they have chosen to do it through a least cost mechanism of transferring information and private opinion -- the mechanism called an association.

The association framework in the airline industry is indeed related to the regulatory framework that has been described in another report. However, the relationship is one that generically relates the individual airlines to regulatory functions. Individual airlines have a particular vested interest in regulatory functioning and express their opinions on a regular basis to appropriate regulatory agencies. However, instead of expressing that opinion individually, they do it on a collective basis through the association. Thus, it is important to understand that the importance of the association itself is limited except as a tool used by the industry to express opinion.

## AIR TRANSPORT ASSOCIATION

The Air Transport Association (ATA),<sup>2</sup> founded in 1936, is the trade and service organization of the scheduled airlines that operate within the United States. ATA represents about 98 percent of all U.S. scheduled airline passenger service. Among the major objectives of the ATA, safety is the top priority, followed by the improvement of passenger and cargo traffic procedures, economic and technical research, and action on legislation that affects the airline industry. Consideration is also given to planning the airlines' role in augmenting national defense, as well as moving passengers and cargo across international borders. Consideration is given to environmental aspects of airline operations and meeting the energy needs of public transportation.

The Air Transport Association<sup>3</sup> is divided into nine functional departments. They include:

1. Operations and Airports
2. Traffic Services
3. Economics and Finance
4. International Affairs
5. Legal
6. Federal Affairs
7. Public Affairs
8. Public Relations
9. Office of Enforcement.

Activities are conducted through periodic councils and related committees that

<sup>2</sup> Appendix B lists the membership of the ATA.

<sup>3</sup> Much of the information presented in this section was taken from a publication entitled Air Transport Association dated January 1981, published by the Air Transport Association of America, Washington, D.C.

are structured with ATA staff members and airline representatives, with a purpose to address specific issues that may be short- or long-run. A brief description of each of the nine functions undertaken by ATA is provided below. While the survey is brief, more attention is placed on those functions that are of primary importance to this study.

The Operations and Airports Department promotes efficient airline operations and ensures the safest use of air space. The industry participates in the functioning of this department through an airline operations/technical council and six committees dealing with airport and air space management. Industry positions on aircraft maintenance, air traffic control, navigation and landing aids, and control of aircraft noise at airports are some of the more important activities of this department. These functions are carried on with international aviation organizations to guarantee safety for carriers operating anywhere in the world. Forecasting of future airport needs and determination of those projects which are financially viable are also undertaken in this department.

The Traffic Services Department is tasked with broadening the air travel market, improving service, streamlining procedures, and reducing costs of air travel. There is an air traffic conference which is composed of thirty ATA members who are assisted by a series of other committees of airline specialists in developing industry standards for intercarrier agreements, resolutions which are filed with the CAB for final approval. The Traffic Services Department is also responsible for administering and assuring the use of qualified travel agents in promoting air travel. A cargo division within the Traffic Services Department is responsible for freight transportation. They coordinate with the U.S. Postal Service for the air transportation of mail. A military bureau is responsible for coordinating programs to satisfy

military government air transportation requirements.

The Economics and Finance Department prepares detailed reports on the economics of airline operations and the financial position of the industry. Economic issues such as fuel, taxes, load factors, and long-range industry outlooks are also prepared by this department. The department also administers the Airlines Clearinghouse which is a financial facility for the settlement of interline tickets. The catalyst for the work of this department is the Economics and Finance Council and its eight committees -- Corporate Accounting, Revenue Accounting, Credit, Insurance, Taxation, Audit, Pension, and Economic Analysis and Forecasting.

The International Affairs Department addresses itself to issues of overseas travel and competitive practices. Its most important function is in the area of international air transport agreements or bilateral negotiations between the U.S. and a foreign nation. In carrying out this function it provides liaison between the airlines and the Departments of State and Transportation and the CAB, the three Federal Government agencies responsible for negotiating bilateral agreements.

The Legal Department represents the association and the industry before Federal, state and local agencies and before the courts. It receives its guidance from the Law Council and three committees -- Litigation, Security, and Equal Employment Opportunities/Affirmative Action.

The Federal Affairs Department monitors legislation of interest to the aviation industry and represents the industry before Congress and the Executive departments.

The Public Affairs Department deals with state- and local-level air transport matters and works with aviation leaders in local communities

throughout the nation. It maintains liaison with other civil aviation associations throughout the country, disseminating information about industry needs and pursuing cooperation in matters of joint concern.

The Public Relations Department provides airline information to the media, schools and colleges, and the general public.

The Office of Enforcement monitors intercarrier traffic procedures to guarantee uniform standard of airline service. This department deals with reservations, ticketing, advertising, carrier relationships with travel agencies, etc. The Office provides a security program for the prevention of fraudulent practices of criminal acts against the member carriers.

#### AEROSPACE INDUSTRIES ASSOCIATION

The Aerospace Industries Association of America (AIA), the national trade association of aviation manufacturing companies, is engaged in research, development, and manufacture of aerospace systems including manned and unmanned aircraft, missiles, space launch vehicles, and space craft, propulsion, guidance, and control units, as well as a variety of airborne and ground-based equipment essential to the operation of flight vehicles. The AIA was begun in 1917 when the Manufacturer's Aircraft Association was formed to facilitate aircraft production and patent problems during World War I. After the war, the Aeronautical Chamber of Commerce of America, Inc. was established by individuals and companies to promote aviation. During World War II, the Aeronautical Chamber of Commerce established eastern and western Aircraft Manufacturer's Councils to coordinate industry and government issues in the post-war era as aircraft manufacturers began taking a more active role in the organization. In June 1945 the Chamber's name was changed to Aircraft Industries Association and many new responsibilities were added. In the

1950s, as the aircraft industry moved into new fields, particularly missiles and space systems, the Aircraft Industries Association became the Aerospace Industries Association (1959).

The AIA membership includes 49 companies that manufacture aerospace products, two companies and one individual who were early members of the Aeronautical Chamber of Commerce, and seven affiliate members which are firms not qualified for regular membership since they are not aerospace manufacturers but whose activities and interests are supportive to the aerospace industry.<sup>4</sup>

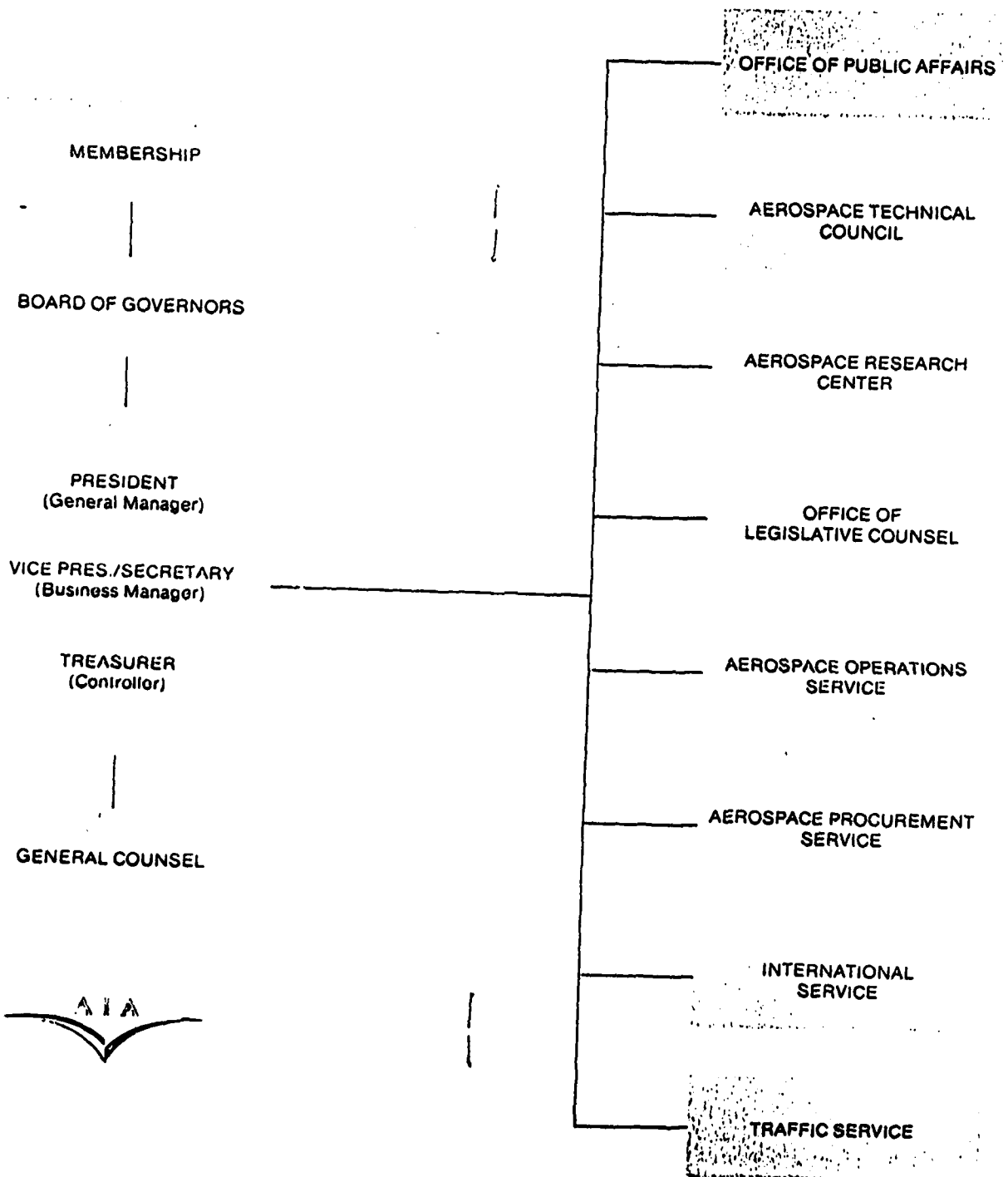
The association, on both a national and international level, represents its membership in a wide range of matters related to their businesses, including matters of technology, contractual and related business practices, and other relationships with governmental agencies. The AIA is a member of the Council of Defense and Space Industry Associations (CODSIA), and on the international level it is a member of the International Coordinating Council of Aerospace Industry Associations (ICCAIA). The international organization is composed of AIA and similar organizations for Canada, Japan, Switzerland, Spain, Germany, the Netherlands, Belgium, Sweden, France, and the United Kingdom as well as the Euro-space Organization. Through this organization, manufacturers have observer status at proceedings of the International Civil Aviation Organization (ICAO).

The activities and actions of the association are determined by its Board of Governors composed of senior executives from 26 member companies and the AIA president, the senior professional employee who also serves as the association's general manager. The flow chart on the following page shows the

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<sup>4</sup> Appendix C presents the membership for the AIA.

# ORGANIZATIONAL CHART



Source: Aerospace Industries Association

organizational set-up of the AIA and its delineation of functional responsibilities. The Executive Committee consists of eight members elected from the Board of Directors, exercising powers of the board subject to the direction of the board. The chairman is elected annually and presides at meetings of the board in full membership. The senior professional staff includes a vice president/secretary and vice presidents for each of the following areas: research and technology, procurement and finance, legislative affairs, public affairs, and international affairs, and directors of the Aerospace Operation Service, the Traffic Service and the Aerospace Research Center.

Underlying this formal committee/council structure is an array of subcommittees, task groups and ad hoc groups which handle hundreds of projects. The broad areas of responsibility for the various councils, services and offices are described briefly below:

The Aerospace Technical Council is a senior technical voice for the industry and manages a number of technical divisions, committees and groups. Its work includes efforts to reduce adverse impact of many management systems such as systems engineering and data management, continues work daily with the FAA on civil aircraft certification requirements and with the Environmental Protection Agency on environmental regulations, reviews and recommends improvements of thousands of military specifications and standards, and provides an overview of standardization procedures, both domestic and international, government and private industry, military and civilian.

The Aerospace Procurement Services has five components: the Procurement and Finance Council, the Industrial Relations Committee, the Industrial

Security Committee, Materiel Management Committee, and Patent Committee. This service is the principal interface for the AIA with the CODSIA. Among its most important projects are the following:

1. Work with member companies on noncompetitive problems affecting financial management and accounting, contract administration and procurement law.
2. The Equal Employment Opportunity, including Affirmative Action programs, occupational safety and health, and compensation practices within the industry.
3. The Industrial Security Committee is concerned with the Defense and Industrial Security Program and its implementation.
4. Subcontractors and purchasing functions for small business and minority enterprises and their relation to government contracts.
5. Protection, both domestic and international, of proprietary rights which companies have in inventions, processes, patents and proprietary technical data.

The Office of Legislative Council communicates the status of legislative items affecting the industry. It also transmits industry views and positions on matters of direct interest to the appropriate agencies.

The Office of Public Affairs informs the public about the accomplishments of the aerospace industry in support of national security, space research and exploration, technological leadership, civil aviation, domestic commerce and international trade. It also provides economic support to the American Society for Aerospace Education which promotes aerospace education at all academic levels.

The International Service is a guidance and coordination point for the

exporting segment of the industry. This activity primarily serves as the medium for the exchange of views between industry and government, thus creating the optimum environment for promoting aerospace exports.

The Traffic Service represents AIA members before federal and state transportation regulatory agencies in carrier rate setting organizations (truck, rail and air).

The Aerospace Operations Service includes five committees and undertakes the following efforts:

1. The Manufacturing Committee evaluates problems relating to manufacturing management systems.
2. The Quality Assurance Committee evaluates issues concerning the control of quality of products produced, and monitors and keeps companies current on manufacturing technology as affected by the introduction of new materials, methods and techniques. There is also coordination with government on quality policies and processes.
3. The Product Support Committee provides the authoritative source for the establishment of industry positions in the formulation, review and revision of logistics policies and procedures pertaining to product maintenance and support.
4. The Spare Parts Committee attempts to achieve economies in improvements in military and commercial airline policies, procedures and practices for selecting, ordering, and inventory control of spare parts, special tools, tests, and aerospace ground equipment.
5. A Service Publications Committee improves the techniques of preparing technical publications and related instructional material in order to transfer job information to the technician to facilitate installation, operation, maintenance, repair, inspection, and overhaul of equipment.

Finally, the Aerospace Research Center engages in research analyses and studies bringing perspective to issues, problems, and policies which affect the industry and the nation. The center addresses complex economic, social, and political issues. In addition to research and study activities, an economic data service which is the statistical arm of the Aerospace Research Center provides facts and figures on the industry and the center as well maintaining a library for aerospace literature.

#### INTERNATIONAL AIR TRANSPORT ASSOCIATION

International Air Transport Association (IATA) is made up of 96 active members and 18 associate member airlines from all over the world.<sup>5</sup> The primary aims of the IATA are to promote safe, regular, and economical air transport for the benefit of peoples of the world to foster commerce and to study the problems connected therewith; to provide means for collaboration among the air transport enterprises engaged directly or indirectly in international air transport service; and to cooperate with the International Civil Aviation Organization and other international organizations. The activities of IATA have established its collective personality as the international air transport industries' link with governments and the public. It serves as a world parliament for the airlines and their representatives in international organizations. On the part of governments, IATA furnishes the medium for coordinating international rates and fares. It helps to carry out vast and economical international airmail transport and to guarantee that the needs of commerce and the safety and convenience of the public are always served.

The IATA was founded in 1945 by airlines from several different countries to help meet the problems anticipated in expanding civil air services at the

5 Members of the IATA are shown in Appendix D.

close of World War II. It was the successor to the previous International Air Traffic Association which was organized in 1919 at The Hague. IATA is closely associated with the International Civil Aviation Organization also established in 1945, which is the international agency of governments which creates world standards for the technical regulation of civil aviation. IATA is a voluntary, nonexclusive, nonpolitical, and democratic organization. Its membership is open to any operating company which is licensed to provide scheduled air service by a government which is eligible for membership in the ICAO. Airlines which are active in international operations are considered active members while domestic airlines are considered associate members. Under its membership system all member airlines are involved in trade association nontariff activities. All participation in the coordination of international fares and rates is left optional.

The trade association activities of IATA include such aspects as technical, medical, legal, facilitation, research and industry finance, plus some noncompetitive matters which are also under the jurisdiction of its traffic conferences, including procedures in administrative matters. Tariff coordination activities include coordination of fares, rates and charges, and rates and levels of commission on sales. Collective agreements within the airlines can then be submitted to governments for approval. IATA's basic source of authority is its annual general meeting in which all active members have an equal vote. Year-round policy directions are provided by an elective executive committee made up of airline chief executives. Its creative work is carried out by its traffic, technical, financial, and legal committees. Fares and rate agreements are under the auspices of the IATA Tariff Coordination Conferences whose meetings and agreements are valid for periods up to two years.

The day-to-day administration of IATA is carried out by a nine-member Executive Management Board, headed by a Director General. The association has two main offices, one in Montreal and the other in Geneva. Regional directors are based in Singapore, Geneva, Buenos Aires, and Washington, and regional technical directors in Bangkok, Geneva, London, Nairobi, and Rio de Janeiro. IATA's traffic service offices are located in Montreal, Geneva, New York and Singapore. IATA's budget is financed from dues paid by its members. However, some activities are self-supporting through charges for the services rendered. Matters relating to forms, procedures, administrative, and other aspects of traffic are dealt with by four different conferences including the following:

- 1) Passenger services conferences which handle matters such as passenger and baggage handling, documentation procedures, rules, regulations, reservations, ticketing, etc.

- 2) Passenger agency conferences dealing with matters concerning the relationship between airlines and recognized passenger sales agents and other intermediaries.

- 3) Cargo services conference overseeing cargo handling documentation procedures, rules and regulations, etc.

- 4) Cargo agency conferences dealing with matters between airlines and intermediaries engaged in the sale and processing of international air cargo.

The tariff coordination process arises from the peculiar nature of air transport. Fares must be fixed by international agreements in which virtually every country has some direct or indirect concern since each individual company controls its own air space. World-wide tariff coordination meetings are held when necessary, but usually once a year.

Cooperation of the airlines in operational technical matters is channeled through the IATA Technical Committee and its various working groups. The

association has always played an important part in the drafting of the ICAO standards and recommended practices which form the accepted international pattern for technical regulation of civil aviation. Its Technical Department is also involved in research in physiological and psychological factors which might affect the safety and well-being of air crews and passengers.

The IATA Financial Committee handles all aspects of accounting and settlements between airlines concerning business they do with one another. Its clearing house settles monthly accounts for interline revenue transactions, allowing the collection of payment of worldwide debts simultaneously by single cash settlement. It's annual rate of turnover for 1980 reached over \$24 billion.

The Legal Committee of IATA is composed of experts from more than 20 airlines and concerns itself with all legal matters having a bearing on international air transport. One of its main activities is to formulate airlines' views in the development of international conventions affecting liability of air carriers to their customers and to other parties, the commission of offenses on board aircraft, the carriage of nuclear materials, and the carriage of mail. It is also involved in the legal aspect of traffic documents and is concerned with government and airport charges.

IATA provides other services, for example, in the area of security, ranging from anti-hijacking measures to counteracting fraud and theft. Finally, one of its main activities is to provide all kinds of cooperation between different governments and airlines in order to speed the process of air travel in a most efficient and effective manner.

## INTERNATIONAL CIVIL AVIATION ORGANIZATION

The International Civil Aviation Organization (ICAO) is the outgrowth of a conference held in Chicago in November of 1944, called the Convention on International Civil Aviation, attended by 52 nations to consider the problems of international civil aviation. Ninety-six articles from that Chicago convention were established that described the privileges and descriptions of all the contracting states in order to provide for the adoption of international standards and recommended practices regulating air navigation. They recommended the installation of navigation facilities by member states and promoted the facilitation of air transport by the reduction of customs and immigration formalities. Overall, the convention established some agreed-upon principles and arrangements so that international civil aviation could be developed in a safe and orderly manner and so that international air transport services could be established on the basis of equality of opportunity and operated soundly and economically. The convention provided that the ICAO would not come into being until the convention was ratified by 26 states. A provisional organization was formed with advisory powers to operate until the permanent organization was created. That occurred on April 4, 1947, and at the invitation of the Government of Canada, Montreal was chosen as the headquarter's site for the organization. By November 1, 1980, 95 nations had accepted the transit agreement which made provision for aircraft of any signatory power to fly over or to land for technical reasons in the territory of any other signatory. Twelve states remain parties to an air transport agreement which calls for the carriage of traffic between the

state of registration of the aircraft and any other signatory state. Appendix E presents a list of the 150 member states.

Article 44 of the Convention clearly states the aims and objectives of the ICAO which are "to develop the principles and techniques of international air navigation and to foster the planning and development of international air transport so as to: a) ensure the safe and orderly growth of international civil aviation throughout the world; b) encourage the arts of aircraft design and operation for peaceful purposes; c) encourage the development of airways, airports, and air navigation facilities for international civil aviation; d) meet the needs of the people of the world for safe, regular, efficient, and economical air transport; e) prevent economic waste caused by unreasonable competition; f) ensure that the rights of the Contracting States are fully respected and that every Contracting State has a fair opportunity to operate international airlines; g) avoid discrimination between Contracting States; h) promote safety of flight in international air navigation; and i) promote generally the development of all aspects of international civil aeronautics."

The ICAO has a sovereign body called the Assembly which meets at least once in three years and is convened by a Council, a governing body of 33 states elected by the Assembly. Each Contracting State is entitled to one vote, and decisions of the assembly are taken by a majority of the votes, except when otherwise provided for in the convention. The Council is a permanent body and is elected for three-year terms. Along with the Council, the Air Navigation Commission, the Air Transport Committee, a Committee on Joint Support of Air Navigation Services, and the Finance Committee provide the continuing direction of the work of the organization. One of the major duties of the Council is to adopt international standards and

recommend practices and to incorporate these into the convention as originally established. The Council may also act as an arbiter between member states on matters concerning aviation. It may investigate situations which present avoidable obstacles to the development of international air navigation and it can take whatever steps are necessary to maintain safety and regularity of operation of international air transport. Appendix F shows the current makeup of the ICAO Council.

Appendix G shows the representative bodies of the ICAO, the Assembly of all Contracting States, a Council as elected by the Assembly, and then the various committees and services. A brief explanation of each of the services is provided below.

The Air Navigation Commission develops international standards and recommended practices and approves procedures for safety regularity and efficiency of air navigation for international travel. The Commission is composed of 15 persons who have suitable qualifications and experience in the science and practice of aeronautics. Its members are nominated by contracting states and appointed by the Council. The Commission reports directly to the Council and is responsible for the examination, coordination, and planning of all the ICAO's work in the air navigation field. The Commission is assisted in its work by an internationally recruited technical secretary of the organization's Air Navigation Bureau. The Air Navigation Commission gets involved in various kinds of activities and upon agreement provides annexes to the ICAO Convention on international civil aviation. Appendix H shows 18 annexes that have been made to the convention, all except number 9 being the responsibility of the Air Navigation Commission.

The Air Transport Committee, whose membership is open to any Council

member state willing to take an active and continuous role, is concerned with the development of international agreements relating to scheduled and nonscheduled air services. One act of great importance has been the development of a multi-lateral agreement dealing with the rights of nonscheduled flights within the European region. The European Civil Aviation Conference, described below, was responsible for developing that agreement, signed in Paris on April 30, 1956. The ECAC has also drawn up an international agreement on the establishment of tariffs for scheduled air services which was open for signature in 1967, entered into force in May 1968, and had been ratified by 15 states by the end of 1980.

Through the Air Transport Committee and a comprehensive facilitation program, several aspects of international air travel have been simplified. The simplification has occurred through eliminating unessential documents, standardizing certain forms, providing minimum facilities at airports, and simplifying handling and clearance procedures. The Air Transport Committee has also been involved in eliminating multiple taxation and insurance requirements in international air transport. This committee is also responsible for the collection of statistics, forecasting and economic planning, and the transport of international mail. Airport and route facility economics also come under the charge of the Air Transport Committee as do carrier fares and rates. Special regional activities are undertaken by the ECAC under the auspices of the ICAO to deal with the special projects of different regions of the world. In addition, specific transport problems are also handled by the Air Transport Committee of the ICAO.

The Committee on Joint Support of Air Navigation Services is responsible for services and facilities that have to be provided on the high seas and in

regions where no one nation can be charged with the responsibility.

Apparently, there are two agreements in effect to provide these facilities and services through joint finances. One involves Iceland and the other Greenland, which are not normal stopping points for transatlantic flights, yet their location is such that they play an important part where information and services for flights along these routes are concerned.

The Legal Committee is a permanent committee which advises on matters referred to it by the Council concerning interpretation of the original Chicago convention. It studies and makes recommendations on such other questions related to public international air law as are referred to it by the Assembly of the Council. They also study private law problems affecting international civil aviation. In its 33 years, the Legal Committee has prepared drafts of thirteen international instruments, the first of which was adopted by the ICAO Assembly and the last twelve by diplomatic conferences. The various areas of interest include aircraft operator liability, property rights, offenses, and other acts committed on-board aircraft: unlawful seizure, unlawful acts against safety, etc. ICAO, in conjunction with the United Nations Development Program, provides technical assistance to various countries' air transport systems when necessary. The assistance may be in the form of training or in services to help develop more efficient operations and operational facilities.

There is also a committee on the unlawful interference with international civil aviation. The ICAO deals with that matter on a technical side to attempt to prevent the unlawful act, but also deals with measures to be taken if preventive action fails. Procedures and guidance on aviation security are a regular part of the ICAO efforts in this committee. Finally, the Finance Committee takes care of all budget and budgeting problems for the ICAO.

## EUROPEAN CIVIL AVIATION CONFERENCE

The European Civil Aviation Conference (ECAC) was inaugurated in 1955 with 19 European states - 3 more added by 1979, for a total of 22 states in its membership.<sup>6</sup> It is an autonomous organization but works closely with the ICAO, using the services of the ICAO Secretariat for much of its work. It has four standing committees, two that deal with economic issues, one with technical issues, and one with facilitation. The working groups and groups of experts are established as needed by the standing committees to carry out ECAC's functions. ECAC is to provide resolutions, recommendations, and other conclusions which are always subject to the approval of its member states. Thus, its role is to assist states in the preparation of their own national regulations and give guidance to the practical, everyday work environment for aeronautical authorities.

According to its constitution, the prime objectives of ECAC are to review the development of European air transport in order to promote coordination, better utilization, and orderly development of such air transport, and to consider any special problems that might arise. In the field of economics, ECAC continuously reviews the development of scheduled and nonscheduled air transport within, to, and from Europe. It collects, analyzes, and disseminates data on air transport, publishing studies and reports on specific subjects. It makes recommendations, particularly concerning cooperation between airlines, charter operations, fares, rates, etc. Multi-lateral agreements on commercial rights of nonscheduled air services and on the procedure for establishing tariffs for scheduled air services were developed in 1956 and 1967, respectively.

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<sup>6</sup> Appendix I shows the membership of the ECAC.

ECAC is also active in the facilitation area, that is, removing obstacles in the path of free passage of aircraft, passengers, cargo, and mail across national boundaries. Security problems also fall under the auspices of the facilitation committee. In the technical field, ECAC has covered a variety of subjects, including air worthiness, communications, and weather problems. ECAC maintains close cooperation and coordination with 20 international government and nongovernmental organizations, in particular with the Council of Europe and the ICAO, with which it has special ties. Appendix J shows a flow chart of the makeup of the ECAC, including its committees and special groups.

## MAJOR ASSOCIATION INTERESTS

### Introduction

It is not an easy task to verify quantitatively interrelationships between associations and to establish the linkages between the association network and regulatory agencies. It is fair to say that much of the work performed by associations is preparatory to presenting individual airline and overall industry positions to regulatory bodies throughout the United States and the world. Interrelationships between associations are minimal except for those associations that have similar membership. For example, the work of the Air Transport Association is significantly different from that undertaken by the Aerospace Industries Association, the former being a representative of individual airlines and the latter representing manufacturers of the various aircraft parts. Whereas the Air Transport Association might be concerned with the individual airline's ability to generate enough capital to replace obsolete equipment and also be concerned with operating expenses and how they affect airlines' capacity to move air traffic, the Aerospace Industries Association is more concerned with general economic conditions, raw material supplies, energy, and various international policies that affect their ability to sell aircraft.

Although there is little apparent direct contact between these two associations, there is certainly a logical complement that exists whether or not it is explicit. Both associations, representing their company membership, have a vested interest in general economic growth, growth in demand for air service, and a stable economy that fosters capital generation, operating efficiency, and increased traffic flow to exist.

While it is difficult to state explicitly a quantitative relationship between associations and other regulatory functions, it is instructive to review briefly some of the major policy issues that have recently been of interest to these major associations. This review may help to give the reader a better flavor for the major issues of importance to these associations and their members. Moreover, it may become obvious, although it is implicit, that there are certain interrelationships that exist between associations and regulatory bodies.

#### Association Interests

One method of determining specific association interests in the airline industries would be to survey and evaluate individual association budgets and resource allocation. This would provide information on where individual airlines perceive their greatest need for collective support on the part of the association. However, in the case of the Air Transport Association and the Aerospace Industries Association, the two major associations of interest here, those budgets are not available for public scrutiny. Alternatively, one can survey some of the major study papers that are produced by these associations as a means of determining major areas of interest.

The Air Transport Association produces numerous research papers and provides testimonies that focus on a variety of topics of interest to them. One report, however, of special interest was issued in September of 1979 by the staff of the Economics and Finance Department of ATA, and deals with airline capital requirements in the 1980s, a subject that has received much attention in the last few years, primarily because of the poor financial condition of individual airlines. This study is mentioned here not only because it was produced by ATA but also because it has been used by ATA in

several other presentations at meetings, seminars, etc. The report, based mostly on data up to 1978, paints an optimistic picture of the future growth of the airlines. Even with this optimistic picture, the report claims that a corporate return on investment of 13-15 percent is needed to provide the needed \$90 billion of capital requirements between 1979 and 1990. Capital investment is broken down into \$80 billion for additional passenger aircraft, \$7 billion for freighter aircraft, and \$3 billion for passenger aircraft to have been delivered immediately in 1979.

The analysis is based on a number of assumptions, most of which might seem optimistic after the perspective of the last two years. It is not necessary here to debate the validity of these assumptions nor the conclusions reached based on those assumptions. However, it is important to point out that raising \$90 billion in capital, based on the 13-15 percent corporate return on investment, is a requirement that most airlines would be hard pressed to meet in today's economic climate. It is interesting that the conclusion of the report points out the necessity to earn such a large rate of return on investment in order to meet the \$90 billion capital investment and points out that the challenge to the airlines is considerable. However, the conclusion ends by stating, "...Still the airline industry has historically met such challenges and undoubtedly will continue to do so in the future." After their performance in the last two years, it is not clear that the authors of the report will still maintain that conclusion. The issue of capital requirements for the 1980s is a major issue from the individual airline point of view. These aircraft will have to be financed from net income, depreciation, and the issuance of additional long-term debt or new equity.

Another issue of major concern to the individual airlines, and presented

through the auspices of the Air Transport Association, is a report that was presented to the Civil Aeronautics Board on Feb. 5, 1980 titled "Fuel - the Most Critical Problem Facing the U.S. Airline Industry." The report claims that in the year 1980 the industry will spend approximately \$29 million per day on jet fuel, more than \$11 million more a day than was spent in 1979. The total fuel bill for the year would be approximately \$11 billion. The report analyzes the impact of fuel prices on the industry, reports on some of the remedial actions taken by several carriers, and then focuses on the essential role of air transportation in the U.S. economy. One major purpose of the report is to point out the changing shares of operating expenses accounted for by fuel and other expenses, what impact on total expenses changes in fuel costs can create, the impacts of lags and fuel cost recovery instituted by the CAB. The report points out that the airlines are instituting remedial actions in terms of fuel conservation and improved efficiency but still highlights the impact of these fuel charge increases on airline performance and ability to raise future capital.

In addition to these two reports, during 1980 the ATA provided three different testimonies on proposed budgets for the airline industry. The first, provided on March 3, 1980, presented the scheduled airlines' views on the fiscal year 1981 NASA Research and Technology Program budget. The ATA requested that the NASA aeronautics research and technology budget be increased before the House Committee on Science and Technology, Subcommittee on Transportation, Aviation and Communications. On the April 15, 1980, the ATA presented the scheduled airlines' views on the proposed FAA fiscal year 1981 budget. The ATA requested that the FAA's research engineering and development funding be increased during fiscal year 1981. Finally, on April 28, 1980, the ATA presented additional views on the proposed FAA fiscal year

1981 budget. The ATA requested that the FAA's facilities and equipment funding, research, engineering, and development funding, airport aid development program appropriation, and the operations and maintenance contribution all be increased.

During 1981 a number of publications and testimonies were issued and presented by the ATA. One publication was titled "The Contribution of Air Transportation to the U.S. Economy," issued in June. This publication stresses the fact that air transport is essential to the functioning of a modern society and to the employment of many individuals and urges the government and business policymakers to consider the airline industry in determining overall economic policy. In addition, a number of testimonies were presented before congressional committees. On February 19th, the ATA presented the views of the scheduled airlines on the FAA fiscal year 1982 research, engineering and development program. The air transport industry identified budget levels necessary to fund facilities and equipment and supported the budget for fiscal year 1982 submitted to Congress in January of 1981. However, it requested that the Committee insure that its research and development priorities are included since the industry is not aware of all of the details of the R&D budget. This testimony was presented to the House Committee on Science and Technology, Subcommittee on Transportation, Aviation and Materials.

On February 26th, the ATA presented a summary statement on U.S. Customs Service budget authorization for fiscal year 1982. They urged the Committee to authorize funding for additional U.S. customs inspectors and to modify inspection procedures to make them more efficient and cost effective. This testimony was presented before the House Committee on Ways and Means on

authorization of appropriations for U.S. Customs Service, Subcommittee on Trade. On March 20, 1981, the ATA in a statement before the House Budget Committee, Task Force on Transportation Research and Development and Capital Resources, opposed cuts to the FAA National Aeronautics and Space Administration and National Weather Service budgets for aviation R&D. The ATA also opposed the elimination of the FAA's facilities engineering and development budget, use of research engineering and development funds for former facilities, engineering, and development programs. The ATA opposed cuts to FAA's facilities and equipment account.

On March 24, the ATA presented the scheduled airlines' views on weather and its impact on aviation safety to the House Committee on Public Works and Transportation, Subcommittee on Investigations and Oversight. On April 3, 1981 the ATA issued a statement that supports the FAA's program for aircraft separation assurance and its reliance on automation, before the House Committee on Science and Technology, Subcommittee on Transportation Aviation and Materials. Also on that same date, the ATA presented a statement which requested increases in the FAA's fiscal year 1981 and fiscal year 1982 budgets for facilities and equipment and air traffic control, maintenance and staffing, before the Senate Appropriations Committee, Subcommittee on Transportation and Related Agencies.

In a statement by ATA on April 6, 1981, they urged the FAA to review proposed amendments to the FAA's safety regulations. This testimony was presented to the House Committee on Government Operations, Subcommittee on Government Activities and Transportation. On May 4th, the ATA presented the scheduled airlines' views on the proposed FAA fiscal year 1982 budget. Here they requested an increase in that budget for air traffic control and

maintenance and staffing requirements for facilities engineering and development, for facilities and equipment, and for research engineering and development. They also requested restoration of fiscal year 1981 funds deleted for air traffic control and maintenance staffing and for facilities and equipment. This testimony was presented before the House Appropriations Committee, Subcommittee on Transportation.

On May 28, the ATA presented formal comments at an annual conference of Hazardous Materials Advisory Council; on June 18th, they provided a statement to the House Public Works and Transportation Committee on the Air Traffic Control situation; on September 2nd, they presented a statement that urged the development of an early airborne collision avoidance capability; on September 29th, they testified before the Senate Foreign Relations Committee on updating the liability and documentation provisions of the Warsaw Convention; and finally on December 22nd, they issued a statement concerning funding for research at the National Aeronautical Space Administration.

In 1982, they issued a book called Airline Economics, edited by Dr. George James, Senior Vice President in charge of Economics and Finance at ATA. This book is a collection of essays, divided into three sections. The first section deals with the economics of the air transport industry; the second section evaluates developments of the industry and provides an outlook for the future; and the third section describes major aspects of the airline industry's planning process.

The Aerospace Industries Association is also very vocal in presenting analyses of particular issues that affect the aerospace industry. Indeed, they provide a publication called Aerospace published twice a year.

In addition to that publication, in December of 1980 the Aerospace

Industries Association published an issue statement. In that document they present issues that Aerospace identified as critical to national security, prestige, economical and political well being, as well as to their own industry's future. It is obvious from the publication that the aerospace industry regards its future as heavily tied to general economic conditions. The topics that are covered in that issue statement include productivity and innovation, capital investment, foreign trade, critical materials, space and space policy, transportation policy in general, research and development, energy issues, and defense procurement. Throughout the issues statement, recommendations are made which provide the AIA members' views on economic and political needs for the industry and the economy in general. For example, in the area of capital investment, noting a decline in the rate of investment in the U.S. in the last few years, the AIA recommends that depreciation be based on reacquisition costs of capital rather than original costs for corporate income tax, government procurement cost regulations, and economic indicator measures, (particularly gross investment, net investment, and capital formation for future growth). They also recommend legislation to provide more rapid depreciation of plant and equipment. In addition, they recommend the elimination of the double taxation of profits and the taxation of interest income at the same rate as business income, or establishing it at a preferential rate. They also recommend legislation to provide economic incentives for regulatory compliance in order to stimulate R&D for technological development. The recommendations throughout the issues statement are specific in nature and are meant to provide more than just general guidance in managing the economy and providing an optimistic future for the aerospace industry.

The International Air Transport Association, as one might expect, deals in issues that are quite different from those of domestic trade associations. At the 37th annual meeting, held in France in October of 1981, the individual carriers appealed to the association to push for changes in tariff and traffic rules and to help police the industry's growing malpractice in ticket discounting and agent fees. In December of the year, the North Atlantic Passenger Traffic Conference was held with an aim to develop an agreed fare structure for approval by the necessary governments. The president of the IATA emphasized the importance of the tariff meeting within the framework of the association's future effectiveness. In fact, he said, "This will be an important test of our ability to take steps that will improve the situation on the North Atlantic, the conference's one key to the future of our organization."

Elements of a new tariff structure were formulated during the IATA passenger tariff conference held in Geneva in December. Separate government-to-government meetings concerning international tariff coordination were held late in the month at the European Civil Aviation Conference. Proposals which emerged from the ten-day meeting included the following:

1. Establishing a simplified fare structure of approximately four or five main fares with provisions for additional rates that might be required for local competitive reasons.
2. A "fare band" concept which established a floor and ceiling price for the main categories of fares enabling some shifting flexibility by carriers without the necessity to apply for a fare change.
3. A cost indexing system, equivalent to the U.S. standard foreign fare level system which allows for price adjustment on a regular pattern based on the percentage of change of the reference index over a given period of time.

The International Civil Aviation Organization operated in 1980 on a budget of approximately \$20 million. Its estimated budgets for the years 1981, 1982, and 1983 were \$21.2 million, \$22.5 million, and \$23.9 million, respectively. Most of the funds are appropriated to the Office of the Secretariat which is responsible for most functions conducted within the organization. In terms of estimated obligations, the largest within the Office of the Secretariat are allocated to the Office of the President of the Council and Office of the Secretary General and the Bureau of Administration and Services - these two offices representing more than half of the allocated funds to the Secretariat. Common staff costs make up about 20 percent of the overall allocation to the Secretariat.

The European Civil Aviation Conference concerns itself with price impacts in international multilateral tariff coordination. A review of the ECAC budget provides some further detail into their major interests in resource allocation. Budget estimates provided in 1979 for the years 1980 through 1982 for the overall operations of the ECAC range from \$767,100 to \$968,800, a relatively small budget. Approximately half of the budget went to the staff of ECAC for substantive work, with other major portions going to meetings and administrative and language services staff. No greater detail in the breakdown of these expenditures is provided in the ECAC budget.

There is a strong interrelationship between the work of the ICAO and the ECAC. It is a long-standing relationship and one which will no doubt continue in the future. One might think of the ICAO as an umbrella organization with the ECAC as one regional council within that organization, responsible for European activities. The issues in which both organizations are involved are similar and their cooperation is substantial.

APPENDICES

APPENDIX II-A

## ASSOCIATIONS

An alphabetical listing, by group name, of international associations in the aerospace/aviation field. Listings include top personnel and phone numbers.

### ACADEMY OF MODEL AERONAUTICS

T-23  
815 15th St. N.W.  
Washington, DC 20005  
Telephone—202/347-2751  
Exec. Dir.—John Wooten  
Adm. Dir.—Vance Martin

Official Publication:  
Model Aviation

### AERIAL CRANE OPERATORS COMMITTEE

AGCO  
T-26  
1420 Phoenixville Pike  
West Chester, PA 19380  
Telephone—215/644-4430  
Chair.—John Wright, Pres.—KeyStone Helicopter Corp., 1420 Phoenixville Pike, West Chester, PA 19380  
Vice-Chair.—Frank E. Clark, Pres.—Orlando Helicopters Airways, Inc., Box 2802, Orlando, FL 32817

### AEROBATIC CLUB OF AMERICA, INC.

T-26  
Pompano Beach Center Bldg.  
1401 E.E. 10th St.  
Pompano Beach, FL 33060  
Pres.—Ron Cashby  
V. P.—Chad McHenry

### AERO CLUB OF BUFFALO, INC.

T-32  
c/o John C. Seal/Club Coord.  
S-7687 Lower East Hill Rd.  
Garden NY 13033  
Telephone—716/941-5734  
Pres.—Hugh M. Neilson, Hill Aerospace  
Tucson Box 1, Buffalo, NY 14250

### AERO CLUB OF NEW ENGLAND

T-35  
Box 163  
East Boston, MA 02128  
Telephone—617/227-5050  
Pres.—Dean C. Edwards, Jr.

### AERO CLUB OF WASHINGTON

T-38  
Suite 700  
1829 K St. N.W.  
Washington, DC 20006  
Telephone—202/296-5604  
Pres.—Robert E. Williams, Jr., Federal Affairs  
United Airlines Int. Center, 11th & K St. N.W.  
Washington, DC 20006

### AFRICAN CIVIL AVIATION COMMISSION

AFCAC  
T-40  
15, Boulevard de l'Indépendance  
Box 2194  
Dakar  
Senegal  
Telephone—22/3030  
Cable: AFCAC/SEC

Pres.—Moussa Allassane Toure, Dir.—Civil Aviation, Box 277, Bamako, Mali  
Soc'y.—L. Tombolan

### AERONAUTICAL FREQUENCY COMMITTEE

AFIC  
T-42  
2551 River Rd.  
Annapolis, MD 21401  
ESS: F000X/KA  
Exec. Sec'y.—H. L. Lehman  
(Studies aeronautical systems concepts & makes recommendations pertaining to the development, use & control of radio frequencies)

### AERONAUTICAL RADIO, INC.

ARINC  
T-43  
2551 River Rd.  
Annapolis, MD 21401  
Telephone—301/266-3600  
ESS: F000X/KA  
Chair.—D. & Pres.—George F. Mansur  
V. P.—Ops.—E. R. Arvidson  
(Not-for-profit company providing comm. service to the air transport industry)

### AERONAUTICAL RESEARCH ASSOCIATES OF PRINCETON, INC.

AHAP  
T-44  
Box 2229  
50 Washington Rd.  
Princeton, NJ 08540  
Telephone—609/452-2950  
Pres.—Dr. Brian Quinn  
V. P.—Aerophysics Branch—Dr. Robert McCullough  
(Basic & applied research & consulting)

### THE AEROSPACE CORP.

T-48  
(Mail Box 92957  
Los Angeles, CA 90009)  
General Offices:  
2350 E. El Segundo Blvd.  
El Segundo, CA  
Telephone—310/640-5000  
Pres.—Dr. Eberhard Hechtel  
Group V. P.—Austin—William W. Drake

### AEROSPACE DEPARTMENT

UAW  
United Automobile, Aerospace & Agricultural Implement Workers of America

T-50  
8100 E. Jefferson Ave.  
Detroit, MI 48214  
Telephone—313/926-5277  
Ch. Aerospace Dept.—Raymond Majors  
Asst. Dir.—Gordon Fleming

### AEROSPACE EDUCATION FOUNDATION, INC.

T-54  
1750 Pennsylvania Ave., N.W.  
Washington, DC 20006  
Telephone—202/637-3370  
Exec. Dir.—Russell E. Dougherty

Soc'y.—Dr. Don C. Garrison

### AEROSPACE & ELECTRONIC SYSTEMS SOCIETY

AESS  
T-58  
c/o The Institute of Electrical & Electronic Engineers, Inc.  
345 E. 47th St.  
New York, NY 10017  
Telephone—212/544-7900  
Pres.—Louis J. Gribbin  
Exec. V. P.—Hedell A. Stangli

### AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.

AIA  
T-63  
1725 DeSales St. N.W.  
Washington, DC 20036  
Telephone—202/347-2115  
TWX 710-822-0134  
Pres. & Gen. Mgr.—Karl G. Hurr  
V. P. & Soc'y.—Samuel L. Wright

### AEROSPACE MEDICAL ASSOCIATION

T-66  
c/o Rufus B. Hessberg, M.D.  
Washington Natl. Airport  
Washington, DC 20001  
Telephone—703/892-2240  
Pres.—Walter L. Jones, M.D., NASA/JSC  
Washington, DC 20546

Official Publication:  
Aviation, Space & Environmental Medicine  
Editor—Sidney D. Leverett, Ph.D., 103 Loomis  
Blaven, San Antonio, TX 78237

### AFRICAN AIRLINES ASSOCIATION

AIRAA  
T-69  
Rms. 509-515, Sadler House  
Box 20116  
Nairobi  
Kenya  
Telephone—212/201  
Mohammed Ahmad, Gen. Mgr., Ethiopian Airlines,  
Box 1755, Addis Ababa, Ethiopia  
Brig. Gen. E. M. Hambo, Mng. Dir., Zambia Airways, Box 272, Lusaka, Zambia

### AIRBORNE LAW ENFORCEMENT ASSOCIATION, INC.

T-72  
Suite 929  
500 Newport Center Bld.  
Newport Beach, CA 92660  
Pres.—Robert L. Brooks, Jefferson County Sheriff's Dept., 716 N. 21st St., Birmingham, AL 35203  
V. P.—Jim Simpson, Portsmouth Police Dept., 5120 W. Military Hwy., Chesapeake, VA 23021  
(Organization to encourage communications & liaison between law enforcement agencies & aviation interests)

# T-78 • INTERNATIONAL ASSOCIATIONS

## AIRCRAFT APPRAISAL ASSOCIATION OF AMERICA, INC.

T-78  
Box 1000  
Wilkes-Barre, PA 18701  
Telephone—405-342-7248  
Pres. Gen. Mgr. & Editor—Bernard McGowan  
V. P. & Sales Mgr.—Dorothy McGowan

Official Publication:  
The Aircraft Photo Digest

## AIRCRAFT ELECTRONICS ASSOCIATION, INC.

T-84  
Box 1981  
Independence, MO 64055  
Telephone—816-373-6565  
Pres.—Lafayette Danley, Avionics Specialist Inc.  
3721 Premier Court, Memphis, TN 38118  
Exec. Dir.—Monte Mitchell, Box 1981,  
Independence, MO

## AIRCRAFT MECHANICS FRATERNAL ASSOCIATION

T-88  
Suite 1A, Davis Bldg.  
4150 Cypress Rd.  
St. Ann, MO 63074  
Telephone—314-423-0440  
Natl. Dir.—O. V. DeLo-Fernand  
Safety & Standards Dir.—James Douglas  
Stirling

## AIRCRAFT OWNERS & PILOTS ASSOCIATION

AOPA  
T-90  
Air Flight, Bldg.  
7315 Wisconsin Ave.  
Washington, DC 20014  
Telephone—801-654-0500  
Telex 89 6468  
TWX 710-824-0005  
Cable: AOPA  
Pres.—John L. Baker  
Sr. V. P.—Publications—Edward G. Troup

Official Publications:  
AOPA Airport Report  
AOPA'S Airports, U.S.A.  
AOPA Aviation Fact Card  
AOPA Guide To Congressional Contacts  
AOPA Pilot  
AOPA Handbook for Pilots  
AOPA Special Reports  
AOPA Way Flyer  
Yesterday's Wings  
AOPA Newsletter  
Editor—Arthur Santelico

General Aviation National Report  
The Flying Club  
Planes to Fly Vol. 1, 2 & 3

## AIR FORCE ASSOCIATION

T-94  
1750 Pennsylvania Ave., N.W.  
Washington, DC 20006  
Telephone—202-637-3300  
Pres.—Victor H. Krugel  
Secy.—Earl D. Clark, Jr.

Official Publication:  
Air Force Magazine  
Editor-in-Chief—F. Clifton Berry, Jr.

## THE AIR FORCE HISTORICAL FOUNDATION

AFHF  
T-98  
Bldg. 361  
Dilling AFB  
Washington, DC 20331  
Telephone—202-473-5741

Pres.—Lt. Gen. John B. McPherson, USAF  
(Ret.)  
V. P.—Brig. Gen. Brian S. Genderson, USAF  
(Ret.)  
Official Publication:  
Aerospace Historian  
Editor—Dr. Robin Higham, Eisenhower Hall,  
Kansas State University, Manhattan, KS 66506  
(Tel. 913-532-6733)

## THE AIR FORCE MUSEUM FOUNDATION, INC.

AFMF  
T-103  
Box 33624, AMC B.  
Wright-Patterson AFB, OH 45433  
Telephone—513-258-1218  
Chrm.—John F. Farley  
Exec. Secy.—Franklin C. Wolf

## AIR FREIGHT ASSOCIATION OF AMERICA

T-106  
Suite 607  
1730 Hynes Blvd., N.W.  
Washington, DC 20006  
Telephone—202-793-1050  
Pres.—Harvey Pollack, Pres. Profit by Air, Box  
90897, Los Angeles, CA 90009  
Exec. V. P. & Controller—Leon P. Hoffer, 1730  
Hynes Blvd., N.W., Washington, DC 20006

## AIR FREIGHT MOTOR CARRIERS CONFERENCE

T-109  
1616 P St., N.W.  
Washington, DC 20006  
Telephone—202-797-5364  
Exec. Dir.—George H. Marshall

## AIRLIFT ASSOCIATION INC.

T-112  
1095 Ambridge Dr.  
Conitoville, OH 45659  
Telephone—513-435-0290  
Chrm.—Brig. Gen. Malcolm P. Hoxford, USAF  
(Ret.), 1209 Tatum Dr., Alexandria, VA 22307  
Pres.—Robert D. Eisenhart, Boeing Military  
Aircraft Co., 1095 Ambridge Dr., Conitoville, OH  
45659

## AIRLINE CHARTER TOUR OPERATORS ASSOCIATION

T-115  
c/o Borus & Garofalo, P.C.  
1120 Connecticut Ave., N.W.  
Washington, DC 20036  
Telephone—202-296-3766  
Pres.—Doran Jacobs, Space & Leisure Time, 254  
W. 31st St., New York, NY 10001 (Tel. 212-695-  
1162)

## AIRLINE DIVISION

Intl. Brotherhood of Teamsters, Chauffeurs,  
Warehousemen & Helpers of America  
T-118  
Suite 1020  
5959 W. Century Blvd.  
Los Angeles, CA 90045  
Telephone—213-645-9860  
Secy.—Travis—Marvin L. Griswold

## AIR LINE EMPLOYEES ASSOCIATION INTERNATIONAL

T-124  
5600 S. Central Ave.  
Chicago, IL 60638  
Telephone—312-767-3333  
Pres.—Victor J. Harbord  
V. P.—Robert D. Haskin

Affiliates:  
Air Line Pilots Assn.  
Assn. of Flight Attendants  
Canadian Air Line Dispatchers Assn.

## AIRLINE INDUSTRIAL RELATIONS CONFERENCE

AIR Conference  
T-128  
1703 New York Ave., N.W.  
Washington, DC 20006  
Telephone—202-626-4255  
Pres.—Quinn M. Buckmaster, Senior V. P.,  
Personnel & Industrial Rel., United Airlines, Inc.  
66100, Chicago, IL 60660  
V. P. & Exec. Dir.—James E. Conway,  
Washington, DC

## AIRLINE OPERATIONAL CONTROL SOCIETY

AOC'S  
T-130  
9 White Oaks Dr.  
St. Peters, MO 63376  
Telephone—314-278-6831  
Chrm.—Stefan Borg Reunert  
Secy.—Treas.—Jerry F. Albrecht  
To enhance & perpetuate industry understanding  
of the safety, dependability & economic value of  
the concept of ground based operational control  
expressed by qualified & competent individuals

## AIRLINE PASSENGERS ASSOCIATION, INC.

APA  
T-134  
(Mail Box 220074)  
Dallas, TX 75264  
800 W. Airport Hwy.  
11th Fl.  
Irving, TX 76061  
Telephone—214-439-8160  
Chrm. & CEO—Tom Mathews

Washington Office:  
WASHINGTON, DC 20006, Suite 160, 1919  
Pennsylvania Ave., N.W. (Tel. 202-293-5015, Telex  
89-474)

## Official Publications:

Apace Newsletter  
First Class Magazine

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on hotel & car rental, tracking system for lost luggage,  
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APPENDIX II-C

MEMBERS OF THE AEROSPACE INDUSTRY ASSOCIATION

Manufacturing Members

Abex Corporation	Lear Siegler, Inc.
Aerojet-General Corporation	Lockheed Corporation
Aeronca, Inc.	Martin Marietta Aerospace
Avco Corporation	McDonnell Douglas Corporation
The Bendix Corporation	Menasco Inc.
The Boeing Company	Northrop Corporation
CCI Corporation	Parker Hannifin Corporation
The Marquardt Company	Pneumo Corporation
Chandler Evans, Inc.	Cleveland Pneumatic Co.
Control Systems Division of	National Water Lift Co.
Colt Industries Inc.	Raytheon Company
Criton Corporation	RCA Corporation
E-Systems, Inc.	Rockwell International Corporation
The Garrett Corporation	Rohr Industries, Inc.
Gates Learjet Corporation	The Singer Company
General Dynamics Corporation	Sperry Corporation
General Electric Company	Sundstrand Corporation
General Motors Corporation	Sundstrand Advanced Technology
Detroit Diesel Allison Division	Group
The BFGoodrich Company	Teledyne CAE
Goodyear Aerospace Corporation	Textron, Inc.
Gould Inc.	Bell Aerospace Textron
Grumman Corporation	Bell Helicopter Textron
Hercules Incorporated	Dalmo Victor Operations
Honeywell Inc.	Hydraulic Research
Howmet Turbine Components	Thiokol Corporation
Corporation	TRW Inc.
Hughes Aircraft Company	United Technologies Corporation
IBM Corporation	Vought Corporation
Federal Systems Division	Western Gear Corporation
ITT Telecommunications &	Westinghouse Electric Corporation
Electronics Group -	Public Systems Company
North America	Wyman-Gordon Company
ITT Aerospace/Optical Division	
ITT Avionics Division	
ITT Defense Communications	
Division	
ITT Gilfillan	

APPENDIX II-C (continued)

Division B Members

AviQUIPO, Inc.  
Frank B. Hall and Company  
Parker Aviation Division

Division of Affiliate Members

Air Carrier Service Corporation  
Associated Aerospace Activities, Inc.  
British Aerospace Inc.  
Commerce Overseas Corporation  
Eastern Aircraft Corporation  
National Credit Office, Inc.  
U.S. Aviation Underwriters, Inc.

APPENDIX II-D



Public Information Department

# International Air Transport Association

P.O. Box 160, 1216 Cointrin, Geneva, Switzerland  
2000 Peel Street, Montreal, Quebec, Canada H3A 2R4

## MEMBERSHIP OF IATA

(As at 20 November 1981)

### ACTIVE MEMBERS (96)

**Aer Lingus Teoranta**  
P.O. Box 180  
Dublin Airport  
Dublin  
Ireland

**Aerolíneas Argentinas**  
Paseo Colón 185  
Buenos Aires  
Argentina

**Aeronaves de México S.A. (AEROMEXICO)**  
Paseo de la Reforma 445  
Mexico 5, D.F.  
Mexico

**Aerovías Nacionales de Colombia S.A. (AVIANCA)**  
Centro Administrativo  
Avenida Eldorado No. 93-30  
Bogota  
Colombia

**Air Afrique**  
01 B.P. 3927  
Abidjan 01  
Ivory Coast

**Air Algérie**  
1 Place Maurice Audin  
Algiers  
Algeria

**Air Canada**  
1 Place Ville Marie  
Montréal, Québec  
Canada H3B 3P7

**Air France**  
1 Square Max Hymans  
F-75741 Paris Cedex 15  
France

**Air Gabon**  
B.P. 2206  
Libreville  
Gabon

**Air Guinée**  
B.P. 12  
Conakry  
Guinea

**Air-India**  
Air-India Building  
218 Backbay Reclamation  
Nariman Point  
Bombay 400 021  
India

**Air Malawi Limited**  
P.O. Box 84  
Blantyre  
Malawi

**Air Mali**  
B.P. 27  
Bamako  
Mali

**Air Malta**  
Head Office  
Luqa  
Malta

• **Air Mauritius**  
Rogers House  
5 President John Kennedy Street  
P.O. Box 60  
Port Louis  
Mauritius

**Air New Zealand**  
Private Bag  
Auckland 1  
New Zealand

**Air Niugini**  
ANG House  
Jacksons Airport  
P.O. Box 7186  
Boroko  
Papua New Guinea

# ACTIVE MEMBERS (Cont.)

- **Air Pacific**  
Private Bag  
G.P.O. Suva  
Fiji
- Air Tanzania Corporation**  
Tancot House  
City Drive  
P.O. Box 543  
Dar-es-Salaam  
United Republic of Tanzania
- **Air Tuaru Corporation**  
Bonriki International Airport  
P.O. Box 274  
Bikenbeu  
Tarawa, Republic of Kiribati
- **Air UK**  
Berkeley House  
51-53 High Street  
Redhill, Surrey, RH1 1RX  
England
- **Air Vanuatu Limited**  
P.O. Box 5413CC  
501 Swanston Street  
Melbourne, Vic. 3000  
Australia
- Air Zaïre**  
4, avenue du Port  
P.O. Box 8552  
Kinshasa  
Zaïre
- ALIA — The Royal Jordanian Airline**  
P.O. Box 302  
Amman  
Jordan
- Alitalia — Linee Aeree Italiane**  
P. le G. Pastore  
I-00144 Eur-Rome  
Italy
- **American Airlines Inc.**  
P.O. Box 61616  
Dallas/Fort Worth Airport  
Texas 75261  
U.S.A.
- Angola Airlines — see**  
"TAAG — Linhas Aereas de Angola"
- **Arab International Airlines (ARABIA)**  
158 El-Hegaz Street  
Heliopolis, Cairo  
Egypt
- Ariana Afghan Airlines Co. Ltd.**  
P.O. Box 76  
Kabul  
Afghanistan
- Austrian Airlines**  
Fontanastrasse 1  
P.O. Box 50  
A-1107 Vienna  
Austria
- AVIANCA — see**  
"Aerovías Nacionales de Colombia S.A."
- **Braniff International Inc.**  
P.O. Box 61747  
Dallas/Fort Worth Airport  
Texas 75261  
U.S.A.
- British Airways**  
Speedbird House  
P.O. Box 10  
Heathrow Airport (London)  
Hounslow, Middlesex, TW6 2JA  
England
- British Caledonian Airways Ltd.**  
Caledonian House  
Crawley, West Sussex, RH10 2XA  
England
- Cameroon Airlines**  
3, avenue du Général de Gaulle  
B.P. 4092  
Douala  
United Republic of Cameroon
- Ceskoslovenske Aerolinie (CSA)**  
Revolucni Trida 1  
Prague 1  
Czechoslovakia
- Compania Mexicana de Aviación S.A. (MEXICANA)**  
Balderas 36 — plso 12  
Apartado Postal 901  
Mexico 1, D.F.  
Mexico

# ACTIVE MEMBERS (Cont.)

## CP Air

One Grant McConachie Way  
Vancouver International Airport  
British Columbia  
Canada V7B 1V1

- **Cruzeiro do Sul S.A. — Serviços Aéreos**  
Av. Almte Silvio de Noronha 365  
Edifício Varig  
Bl. B — s/375 — Aeroporto Santos Dumont  
Rio de Janeiro  
Brazil

## Cubana — see

"Empresa Consolidada Cubana de Aviación"

## Cyprus Airways Limited

21 Alkeou Street  
P.O. Box 1903  
Nicosia  
Cyprus

## Deutsche Lufthansa A.G.

von-Gablenz-Strasse 2-6  
D-5000 Cologne 21  
Federal Republic of Germany

- **Eastern Air Lines Inc.**  
Miami International Airport  
Miami, Florida 33148  
U.S.A.

## Ecuadoriana — see

"Empresa Ecuatoriana de Aviación S.A."

## Egyptair

Cairo International Airport  
Cairo  
Egypt

## El Al Israel Airlines Limited

P.O. Box 41  
Ben Gurion International Airport  
Tel Aviv  
Israel

## Empresa Consolidada Cubana de Aviación (CUBANA)

Edificio La Rampa  
23 y P. Vedado  
Havana  
Cuba

## Empresa Ecuatoriana de Aviación (ECUATORIANA)

Colón y Reina Victoria  
Torres Almagro  
P.O. Box 505  
Quito  
Ecuador

## Ethiopian Airlines

P.O. Box 1755  
Addis Ababa  
Ethiopia

## Finnair Oy

Mannerheimintie 102  
SF-00250 Helsinki 25  
Finland

## \*\* Flying Tiger Line Inc.

7401 World Way West  
P.O. Box 92935  
Los Angeles International Airport  
Los Angeles, California 90009  
U.S.A.

## P.T. Garuda Indonesian Airways

15 Jalan Ir. H. Djuanda  
Jakarta  
Indonesia

## Ghana Airways Corp.

Ghana House  
P.O. Box 1636  
Accra  
Ghana

## IBERIA, Líneas Aéreas de España S.A.

Calle Velazquez 130  
Madrid 6  
Spain

## Icelandair

Reykjavik Airport  
101 Reykjavik  
Iceland

## Indian Airlines

Airlines House  
113 Gurdwara Rakabganj Road  
New Delhi 110001  
India

\* Has elected not to participate in Tariff Coordination

\*\* Participates in Tariff Coordination — Cargo only

# ACTIVE MEMBERS (Cont.)

**Iran National Airlines Corp. (Iran Air)**  
 Mehrabad Airport  
 Iran Air Head Office Building  
 Tehran  
 Iran

**Iraqi Airways Limited**  
 Baghdad International Airport  
 Baghdad  
 Iraq

**Jamahiriya Libyan Arab Airlines**  
 P.O. Box 2555  
 Haiti Street  
 Tripoli  
 Libyan Arab Jamahiriya

**Japan Air Lines Co. Limited**  
 Tokyo Building  
 7-3 Marunouchi 2-Chome  
 Chiyoda-ku  
 Tokyo 100  
 Japan

**Jugoslovenski Aerotransport (JAT)**  
 P.O. Box 749  
 Birceaninova 1/111  
 Y-11000 Belgrade  
 Yugoslavia

**Kenya Airways Ltd.**  
 P.O. Box 19002  
 Nairobi  
 Kenya

**KLM Royal Dutch Airlines**  
 P.O. Box 7700  
 Schiphol Airport  
 Netherlands

**Kuwait Airways Corporation**  
 Kuwait International Airport  
 P.O. Box 394  
 Kuwait

**LAM — Linhas Aéreas de Moçambique**  
 Mavalane Airport  
 P.O. Box 2060  
 Maputo  
 Mozambique

• **Línea Aérea del Cobre Ltda. (LADECO)**  
 Casilla 13740  
 Santiago  
 Chile

**Línea Aérea Nacional de Chile (LAN-CHILE)**  
 Aeropuerto de los Cerrillos  
 Camino a Melipilla 5,300  
 Santiago  
 Chile

• **Líneas Aéreas Costarricenses S.A. (LACSA)**  
 Apartado 1531  
 San José  
 Costa Rica

• **Lloyd Aéreo Boliviano S.A. (LAB)**  
 Aeropuerto Jorge Wilstermann  
 Casilla No. 132  
 Cochabamba  
 Bolivia

**LOT — Polish Airlines — see**  
**"Polskie Linie Lotnicze"**

**Lufthansa — see**  
**"Deutsche Lufthansa A.G."**

**Mexicana — see**  
**"Compania Mexicana de Aviación S.A."**

**Middle East Airlines Airliban**  
 Beirut International Airport  
 P.O. Box 206  
 Beirut  
 Lebanon

**Nigeria Airways Limited**  
 Airways House  
 Murtala Muhammed Airport  
 P.O. Box 136  
 Lagos  
 Nigeria

**Olympic Airways S.A.**  
 96 Syngrou Avenue  
 Athens  
 Greece

**Pakistan International Airlines Corp.**  
 PIA Building  
 Karachi Airport  
 Pakistan

**Pan American World Airways, Inc.**  
 200 Park Avenue  
 New York, New York 10166  
 U.S.A.

# ACTIVE MEMBERS (Cont.)

Philippine Airlines Inc.  
P.O. Box 954  
Manila  
Philippines

Polakie Linie Lotnicze (LOT)  
39, 17 Stycznia Street  
P-00-906 Warsaw  
Poland

• Primeras Lineas Uruguayas de  
Navegación Aérea (PLUNA)  
Colonía 1013-1021  
Montevideo  
Uruguay

Qantas Airways Limited  
Qantas House  
70 Hunter Street  
Sydney, N.S.W. 2000  
Australia

• Royal Swazi National Airways Corporation Ltd.  
P.O. Box 939  
Manzini  
Swaziland

SABENA (Société anonyme belge d'exploitation  
de la navigation aérienne)  
35, rue Cardinal Mercier  
B-1000 Brussels  
Belgium

Saudi Arabian Airlines Corp.  
Saudia New Building  
P.O. Box 620  
Jeddah  
Saudi Arabia

Scandinavian Airlines System (SAS)  
Fack  
S-161 87 Stockholm-Bromma  
Sweden

• Solomon Islands Airways Limited (SOLAIR)  
P.O. Box 23  
Honiara — Guadalcanal  
Solomon Islands

• Somali Airlines  
P.O. Box 726  
Mogadishu  
Somali Democratic Republic

South African Airways  
South African Airways Centre  
P.O. Box 7778  
Johannesburg 2000  
South Africa

Sudan Airways  
P.O. Box 253  
Khartoum  
Sudan

Swiss Air Transport Co. Limited (SWISSAIR)  
P.O. Box  
CH-8058 Zurich Airport  
Switzerland

Syrian Arab Airlines  
P.O. Box 417  
Damascus  
Syrian Arab Republic

TAAG — Linhas Aereas de Angola  
(Angola Airlines)  
Rua Luis de Camoes, 123  
P.O. Box 79  
Luanda — R.P.  
Angola

TAP — Air Portugal  
Apartado 5194  
P-1704 Lisboa Codex  
Portugal

•• Trans-Mediterranean Airways S.A.R.L. (TMA)  
P.O. Box 11/3018  
Beirut  
Lebanon

Trans World Airlines Inc.  
605 Third Avenue  
New York, N.Y. 10158  
U.S.A.

• Trinidad and Tobago (BWIA International)  
Airways Corp.  
Kent House  
Long Circular Road  
Maraval, Port of Spain  
Trinidad and Tobago

Tunis Air  
113, avenue de la Liberté  
Tunis  
Tunisia

AD-A131 878

DEVELOP A NORMATIVE OR DESCRIPTIVE MODEL OF THE  
INTERNATIONAL/DOMESTIC CIVIL AVIATION INDUSTRY VOLUME 3  
(U) SYNERGY INC WASHINGTON DC L H DYMOND ET AL

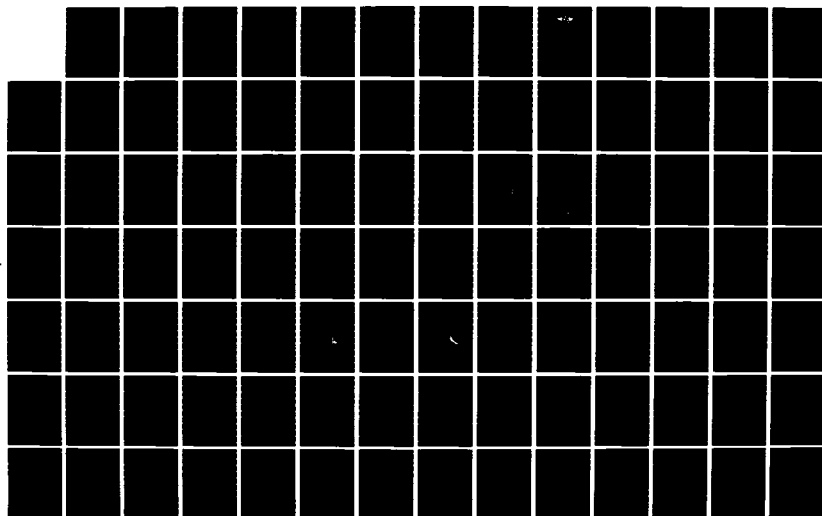
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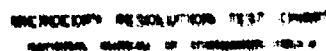
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## ACTIVE MEMBERS (Cont.)

Türk Hava Yolları A.O. (Turkish Airlines)  
Cumhuriyet Caddesi 199-201  
Sisli, Istanbul  
Turkey

Union de Transports Aériens (UTA)  
50, rue Arago  
F-92806 Puteaux  
France

• United Airlines  
P.O. Box 66100  
O'Hare International Airport  
Chicago, Illinois 60666  
U.S.A.

VARIG S.A. (Viação Aérea Rio-Grandense)  
Av. Almirante Sílvia de Noronha 365  
Aeroporto Santos Dumont  
Rio de Janeiro  
Brazil

Venezolana Internacional de Aviación S.A.  
(VIASA)  
Apartado de Correos 6857  
Caracas D.F.  
Venezuela

Zambia Airways Corporation Ltd.  
P.O. Box 30272  
Lusaka City Airport  
Zambia

• Has elected not to participate in Tenth Coordination

## ASSOCIATE MEMBERS (18)

**Aerolíneas Cordillera Ltda (AEROCOR)**  
Avenida Nueva Los Leones 0167-E  
Santiago  
Chile

**Air Liberia**  
c/o Ministry of Commerce, Industry and Transportation  
P.O. Box 2076  
Monrovia  
Liberia

**Ansett Airlines of Australia**  
483 Swanston Street  
Melbourne, Victoria 3000  
Australia

**Aviacion y Comercio, S.A. (AVIACO)**  
Maudes, No. 51  
Edificio Minister  
Madrid, 3, Spain

**Commercial Airways (Pty.) Ltd.**  
P.O. Box 7015  
Bonaero Park 1622, Transvaal  
South Africa

**Douglas Airways Pty. Limited**  
P.O. Box 1179  
Boroko, Port Moresby  
Papua New Guinea

**Eastern Provincial Airways (1963) Limited**  
P.O. Box 5001  
Gander  
Newfoundland  
Canada A1V 1W9

**East-West Airlines Limited**  
19th Level  
323 Castlereagh Street  
Sydney, N.S.W. 2000  
Australia

**IPEC Aviation**  
Hangar 86  
Bristol Street  
Essendon Airport  
Victoria 3041  
Australia

**Kendell Airlines**  
43 Tompson Street  
Wagga Wagga, N.S.W. 2650  
Australia

**Mailing Commuter Services Pty. Ltd.**  
117 Parker Street  
Cootamundra, N.S.W. 2590  
Australia

**Mount Cook Airlines**  
Private Bag  
Christchurch  
New Zealand

**Namib Air (Pty.) Ltd.**  
P.O. Box 731  
Windhoek  
Namibia

**Quebecair**  
P.O. Box 490  
Montreal International Airport  
Dorval, Quebec  
Canada H4Y 1B5

**TALAIR Pty. Limited**  
P.O. Box 108  
Goroka  
Papua New Guinea

**Trans Australia Airlines**  
P.O. Box 2806AA  
Melbourne  
Victoria 3001  
Australia

**Transbrasil S.A. Linhas Aéreas (Trans Brasil)**  
Aeroporto de Congonhas  
Sao Paulo  
Brazil

**Viação Aérea Sao Paulo S.A. (VASP)**  
Edifício VASP  
Aeroporto de Congonhas  
Sao Paulo  
Brazil

# APPENDIX II-E

## THE INTERNATIONAL CIVIL AVIATION ORGANIZATION MEMBER STATES (150)

Afghanistan, Republic of	Ecuador
Algeria	Egypt, Arab Republic of
Angola	El Salvador
Antigua and Barbuda	Equatorial Guinea
Argentina	Ethiopia
Australia	
Austria	Fiji
	Finland
Bahamas	France
Bahrain	
Bangladesh	Gabon
Barbados	Gambia
Belgium	Germany, Federal Republic of
Benin	Ghana
Bolivia	Greece
Botswana	Grenada
Brazil	Guatemala
Bulgaria	Guinea
Burma	Guinea-Bissau
Burundi	Guyana
Canada	Haiti
Cape Verde	Honduras
Central African Empire	Hungary
Chad	
Chile	Iceland
China	India
Colombia	Indonesia
Congo, People's Republic of the	Iran
Costa Rica	Iraq
Cuba	Ireland
Cyprus	Israel
Czechoslovak Socialist Republic	Italy
	Ivory Coast
Democratic Kampuchea	
Democratic People's Republic of Korea	Jamaica
Democratic Yemen	Japan
Denmark	Jordan
Djibouti	
Dominican Republic	Kenya
	Kiribati
	Kuwait

APPENDIX II-E (continued)

Lao People's Democratic Republic  
Lebanon  
Lesotho  
Liberia  
Libyan Arab Jamahiriya  
Luxembourg

Madagascar  
Malawi  
Malaysia  
Maldives  
Mali  
Malta  
Mauritania  
Mauritius  
Mexico  
Monaco  
Morocco  
Mozambique

Nauru  
Nepal  
Netherlands, Kingdom of the  
New Zealand  
Nicaragua  
Niger  
Nigeria  
Norway

Oman

Pakistan  
Panama  
Papua New Guinea  
Paraguay  
Peru  
Philippines  
Poland  
Portugal

Quatar

Republic of Korea  
Romania  
Rwanda

Saint Lucia  
Sao Tome and Principe  
Saudi Arabia  
Senegal  
Seychelles  
Sierra Leone  
Singapore  
Somalia  
South Africa  
Spain  
Sri Lanka  
Sudan  
Surinam  
Swaziland  
Sweden  
Switzerland  
Syrian Arab Republic

Thailand  
Togo  
Trinidad and Tobago  
Tunisia  
Turkey

Uganda  
Union of Soviet Socialist Republics  
United Arab Emirates  
United Kingdom  
United Republic of Cameroon  
United Republic of Tanzania  
United States  
Upper Volta  
Uruguay

Venezuela  
Viet Nam, Socialist Republic of  
Yemen  
Yugoslavia

Zaire, Republic of  
Zambia  
Zimbabwe

THE 10.11.1980

**President: Assad Ketane**

**Secretary: Yves Lambert, Secretary General**

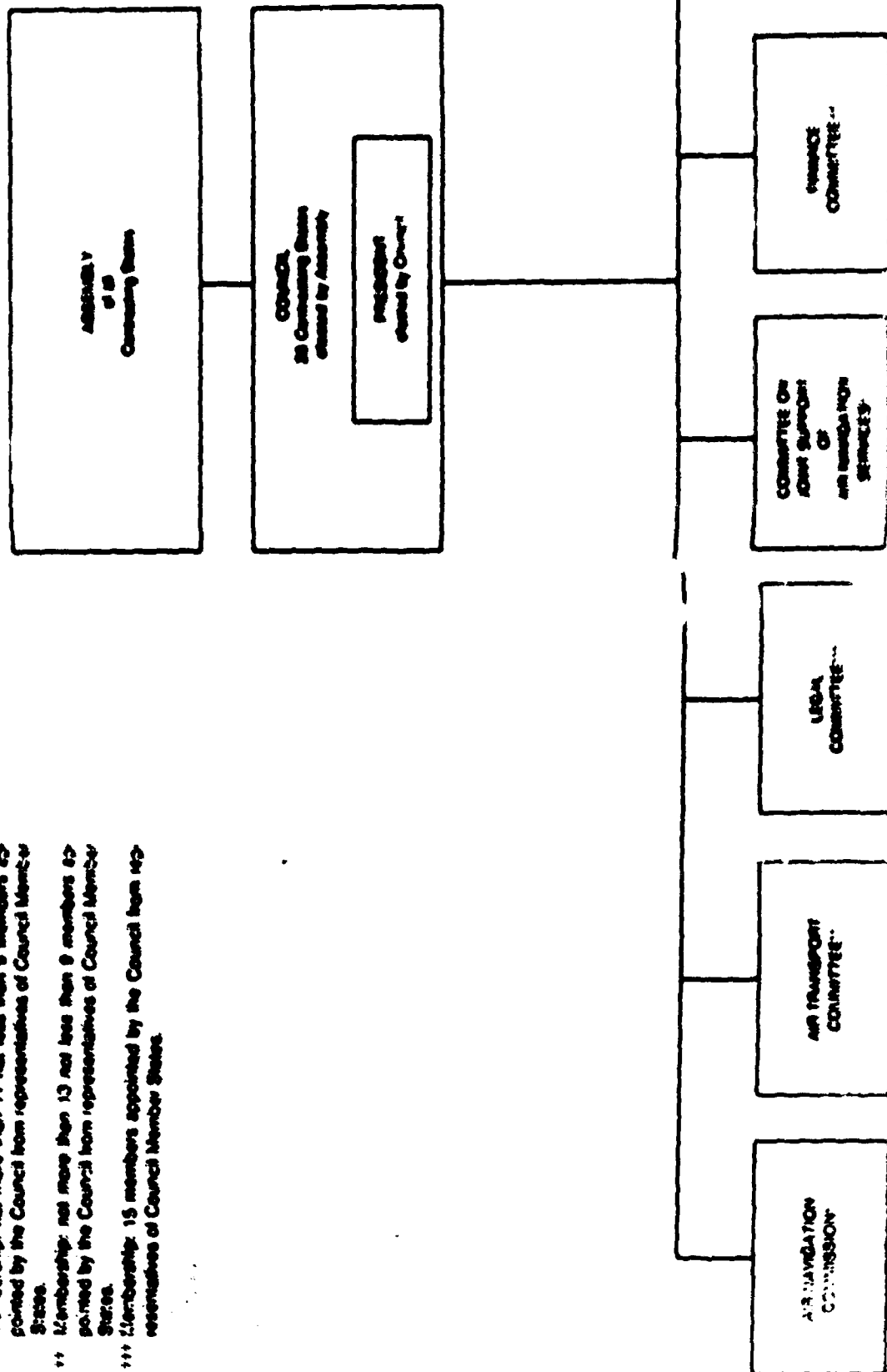
**The twenty-third Session of the Assembly in 1980 elected the following States as Members of the Council for the 1980-1983 period:**

**ALGERIA  
ARGENTINA  
AUSTRALIA  
BRAZIL  
CANADA  
CHINA  
COLOMBIA  
CZECHOSLOVAK SOCIALIST REPUBLIC  
DENMARK  
EGYPT, ARAB REPUBLIC OF  
EL SALVADOR  
FRANCE  
GERMANY, FEDERAL REPUBLIC OF  
INDIA  
INDONESIA  
IRAQ  
ITALY  
JAMAICA  
JAPAN  
LEBANON  
MADAGASCAR  
MEXICO  
NETHERLANDS, KINGDOM OF THE  
NIGERIA  
PAKISTAN  
SENEGAL  
SPAIN  
UGANDA  
UNION OF SOVIET SOCIALIST REPUBLICS  
UNITED KINGDOM  
UNITED REPUBLIC OF CAMEROON  
UNITED STATES  
VENEZUELA**

# REPRESENTATIVE BODIES OF ICAO

- \* Membership: 15 members appointed by the Council from nations received from Contracting States.  
The members are appointed by the Council from representatives of Council Member States.  
The Legal Committee was established pursuant to Assembly Resolution A 1-46. It is open to membership by all Contracting States.
- \*\* Membership: not more than 11 not less than 9 members appointed by the Council from representatives of Council Member States.
- \*\*\* Membership: not more than 13 not less than 9 members appointed by the Council from representatives of Council Member States.
- \*\*\* Membership: 15 members appointed by the Council from representatives of Council Member States.

## APPENDIX II-G



# ON INTERNATIONAL CIVIL AVIATION:

- |   |   |
|---|---|
| 1. Personnel Licensing  | Licensing of flight crews, air traffic control officers and aircraft, maintenance personnel.                                      |
| 2. Rules of the Air   | Rules relating to the conduct of visual and instrument flights.   |
| 3. Meteorological Service for International Air Navigation  | Provision of meteorological services for international air navigation and reporting of meteorological observations from aircraft. |
| 4. Aeronautical Charts  | Specifications for aeronautical charts for use in international aviation.   |
| 5. Units of Measurement to be used in Air-Ground Communications   | Dimensional systems to be used in air-ground communications.  |
| 6. Operation of Aircraft<br>Part I — International Commercial Air Transport. Part II — International General Aviation | Specifications which will ensure in similar operations throughout the world a level of safety above a prescribed minimum.         |
| 7. Aircraft Nationality and Registration Marks  | Requirements for registration and identification of aircraft.   |
| 8. Airworthiness of Aircraft  | Certification and inspection of aircraft according to uniform procedures.<br>(See page 30)  |
| 9. Facilitation   |   |
| 10. Aeronautical Telecommunications   | Standardization of communications equipment and systems (Vol. I) and of communications procedures (Vol. II).                      |
| 11. Air Traffic Services  | Establishment and operation of air traffic control, flight information and alerting services.                                     |
| 12. Search and Rescue   | Organization and operation of facilities and services necessary for search and rescue.  |
| 13. Aircraft Accident Investigation   | Uniformity in the notification, investigation of and reporting on aircraft accidents.   |
| 14. Aerodromes  | Specifications for the design and equipment of aerodromes.  |
| 15. Aeronautical Information Services   | Methods for the collection and dissemination of aeronautical information required for flight operations.                          |
| 16. Aircraft Noise  | Specifications for aircraft noise certification, noise monitoring, and noise exposure units for land-use planning.                |
| 17. Security  | Specifications for safeguarding international civil aviation against acts of unlawful interference.                               |
| 18. Safe Transport of Dangerous Goods by Air (Proposed)   | Specifications for the labelling, packing and shipping of dangerous cargo.  |

*Note: All Annexes, except 9, are the responsibility of the Air Navigation Commission. Annex 9 is the responsibility of the Air Transport Committee.*

APPENDIX II-I



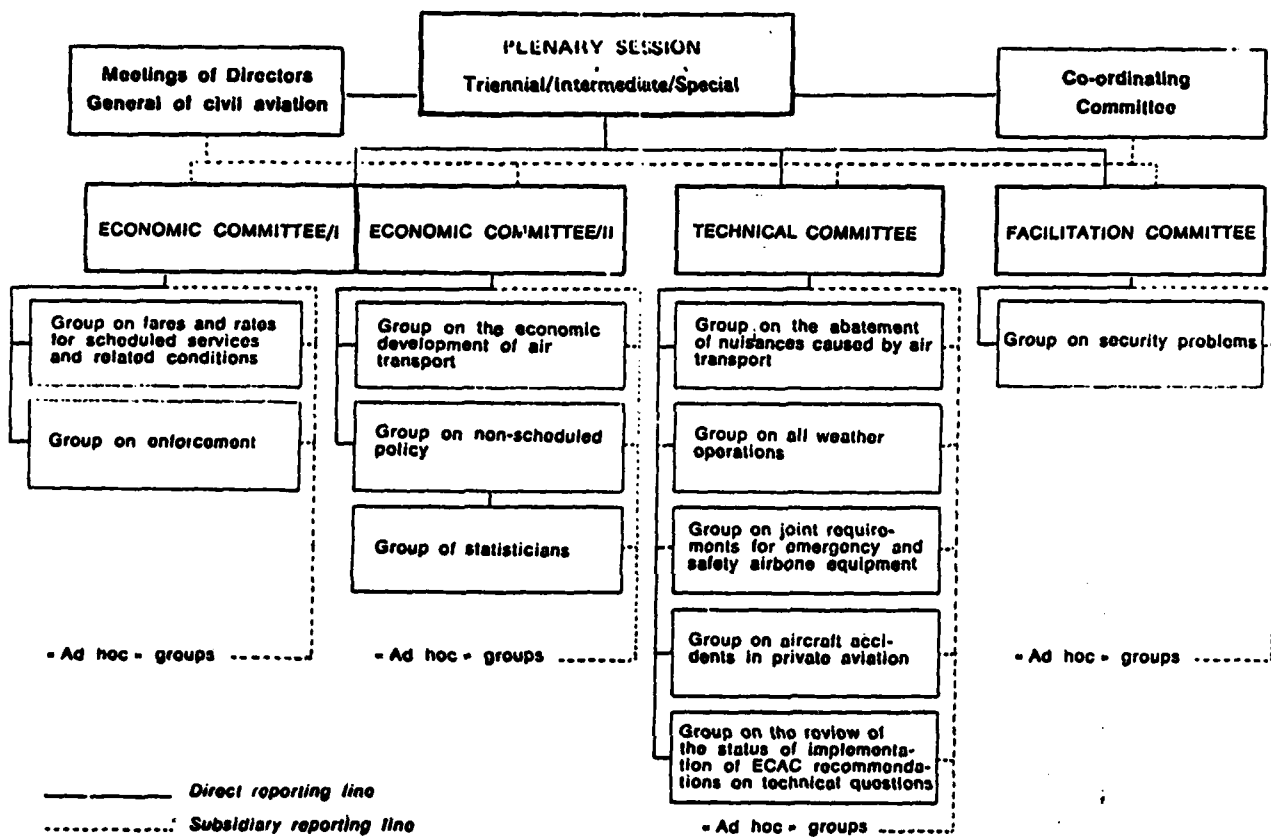
**ECAC Member States:**

Austria  
Belgium  
Cyprus  
Denmark  
Finland  
France  
Germany (Fed. Rep.)  
Greece  
Iceland  
Ireland  
Italy  
Luxembourg  
Malta  
Netherlands  
Norway  
Portugal  
Spain  
Sweden  
Switzerland  
Turkey  
United Kingdom  
Yugoslavia

**Secretariat address:**

**3 bis, Villa Emile-Bergerat  
92522 NEUILLY-SUR-SEINE CEDEX  
France**

# APPENDIX II-J



APPENDIX III

INDUSTRY COMPONENTS AND DEMOGRAPHICS

APPENDIX III-A

TABLE III-A-1

## Carrier Groupings

<u>GROUPING</u>	<u>CARRIERS</u>	<u>ANNUAL REVENUE</u>
<u>MAJORS</u>	AMERICAN BRANIFF CONTINENTAL DELTA EASTERN NORTHWEST PAN AMERICAN REPUBLIC TRANS WORLD UNITED USAIR WESTERN	\$1,000,000,000+
<u>NATIONALS</u>	AIR CALIFORNIA AIR FLORIDA AIRLIFT ALASKA ALOHA CAPITOL FLYING TIGER FRONTIER HAWAIIAN OZARK PACIFIC SOUTHWEST PIEDMONT SOUTHWEST TEXAS INTERNATIONAL TRANSAMERICA WIEN WORLD	\$75,000,000 + \$1,000,000,000

LARGE REGIONALS

AIR MIDWEST	610,000,000 + 674,999,999
AIR NEW ENGLAND	
AIR WISCONSIN	
ALASKA INTERNATIONAL	
ALTAIR	
ASPEN	
BRITT	
CASCADE	
EVERGREEN	
GOLDEN GATE	
GOLDEN WEST	
MIDWAY	
MISSISSIPPI VALLEY	
NEW YORK AIR	
PEOPLE EXPRESS	
PILGRIM	
REEVE	
ROCKY MOUNTAIN	
ROSENBALM	
SOUTHERN AIR	
SHIFT AIRE	
ZANTOP	

MEDIUM REGIONALS

AEROMECH	0 + 89,999,999
AEROSTAR	
AIR NEVADA	
AIR NORTH	
AIR NORTH/NENANA	
AMERICAN EAGLE	
AMERICAN TRANS AIR	
APOLLO	
ARROW	
BIG SKY	
COCHISE	
COLEMAN	
COLGAN	
EMPIRE	
GLOBAL	
GREAT AMERICAN	
IMPERIAL	
INTERCONTINENTAL	
KODIAK	
MACKEY	
MID-SOUTH	
MIDSTATE	
MUNZ	
NEHAIR	
RICH	
SEA AIRMOTIVE	
SKY WEST	
SOUTHEAST	
SUN LAND	
T-BIRD	
WESTERN YUKON	
WRIGHT	

APPENDIX III-B

## APPENDIX III-B

### World Revenue Passenger Miles by Region - 1978

Chart III-B-1 shows revenue passenger miles for the individual airlines of the world in 1978 grouped by region. While Figure 1 presented revenue passenger miles in a flow concept over time with a breakdown of major categories, Chart III-B-1 presents a stock view, that is at one point in time, the year 1978, and provides greater detail into the regional distribution and relative activity of individual airlines around the world. The U.S. and Canada are included as one region, with Europe, Central and South America, the Middle East and Africa, Australia, New Zealand and the Far East each making up another regional category. Revenue passenger miles are shown along the vertical axis represented in millions of revenue passenger miles. It is evident from the chart that the majority of activity in terms of revenue passenger miles occurs in the U.S. and Canada and in Europe in terms of regions of the world. Central and South America and the Middle East and Africa show the smallest revenue passenger miles for the individual airlines of all the other regions. Aside from the Soviet airlines and one British airline, one French airline, and one German airline, most of the major airlines, in terms of revenue passenger miles, in the world include the domestic trunk carriers. The information provided in Chart III-B-1 came from a Boeing Company publication called Dimensions of Airline Growth, published in March of 1980.

# World Passenger Traffic

## Revenue Passenger-Miles for Airlines of the World—1978 (Grouped by Region of Airline Domicile)

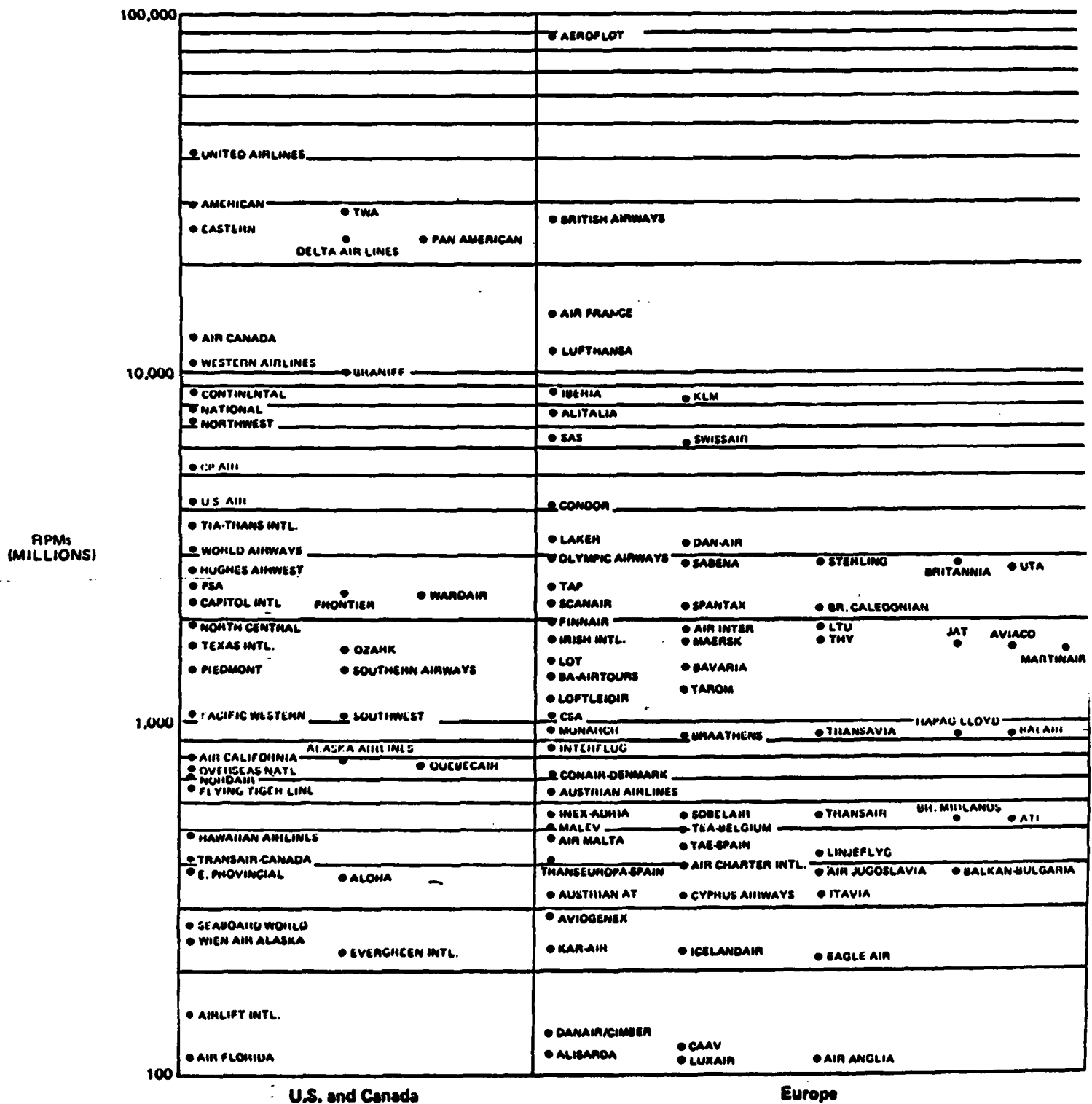
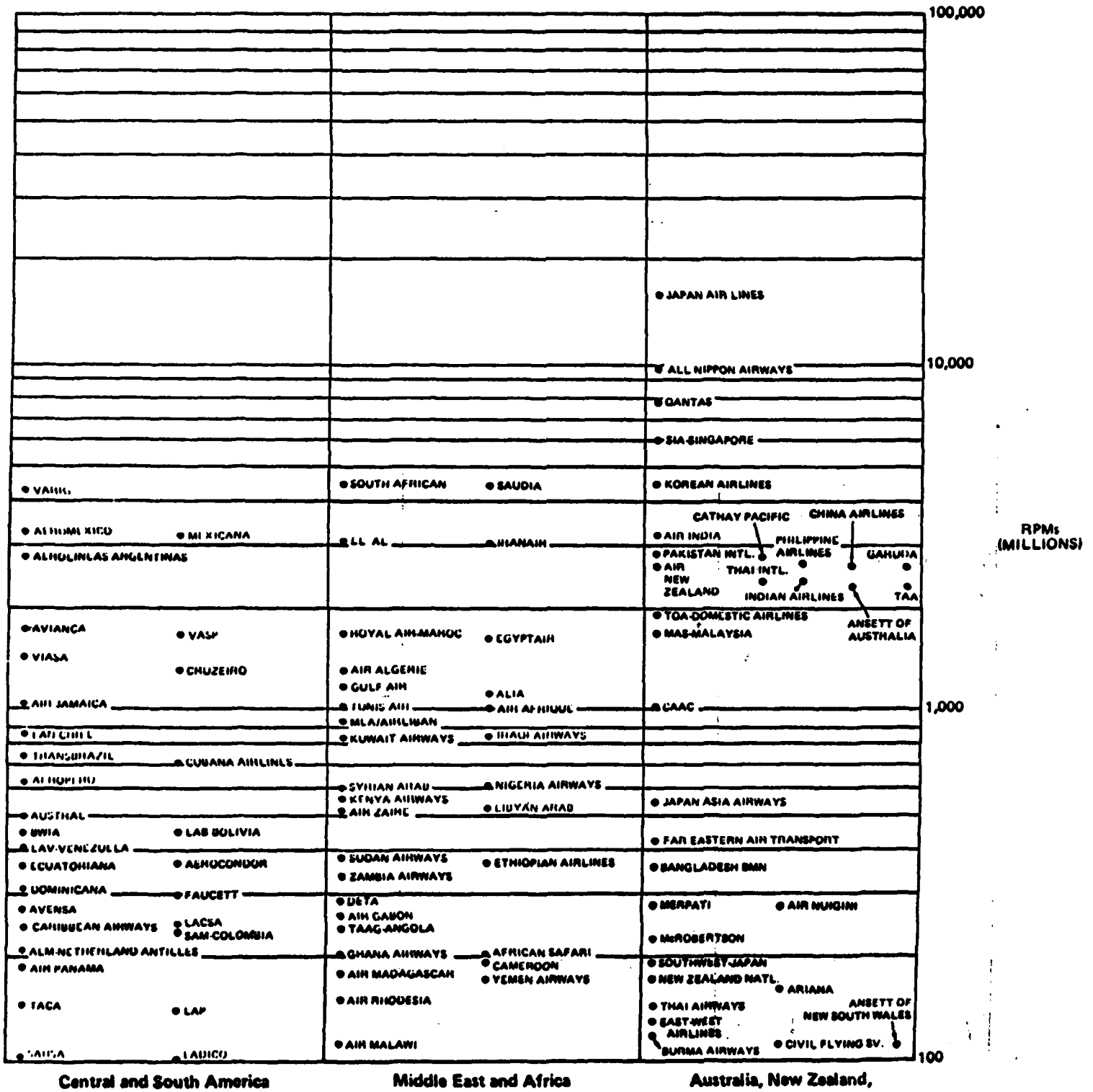


CHART III-B-1 (continued)



Source: Boeing Company, Dimensions of Airline Growth, March, 1980.

APPENDIX III-C

## APPENDIX III-C

### Traffic History by Carrier Class

During 1980, approximately \$200 billion revenue passenger miles of service were experienced by the U.S. domestic scheduled carriers, a figure down from approximately \$209 billion RPMs in 1979. Table III-C-1 shows the breakout of domestic scheduled traffic in billions of revenue passenger miles for the different carrier classes including trunks, locals, regional, intrastate and a total figure for all scheduled service over the period 1960 to 1980 with the decade of the 1970s shown individually for each year. It is interesting to note from the table that all carrier classes showed increases over the 1970s up to and including 1979. However, during 1980, there was a decline in revenue passenger miles for the trunks with increases by the locals and regionals and intrastate carriers maintaining their 1979 levels.

TABLE III-C-1

**U.S. Domestic Scheduled Traffic History by Class of Carriers  
(Billions RPMs)**

<b>Year</b>	<b>Trunks</b>	<b>Locals<sup>1</sup></b>	<b>Regional<sup>2</sup></b>	<b>Intrastate<sup>3</sup></b>	<b>Total</b>
1960	30.8	1.1	0.3	0.2	32.4
1965	52.6	2.6	0.6	0.6	56.3
1970	95.9	7.4	0.9	1.9	106.1
1971	97.8	7.9	0.8	2.1	108.6
1972	108.2	8.9	1.0	2.2	120.3
1973	115.4	9.8	1.1	2.5	128.8
1974	117.6	10.8	1.3	2.7	132.4
1975	119.4	10.7	1.6	2.9	134.6
1976	131.4	12.1	1.7	3.2	148.4
1977	141.3	13.5	1.8	3.8	160.4
1978	164.2	16.5	2.0	4.6	187.3
1979	180.7	19.9	2.4	5.8	208.8
1980	168.2	21.6	4.5	5.8	200.1
1981					

**Source:** Lockheed-California Company, "World Air Traffic Forecast 1980,"  
Report no. FEA/2968 (Burbank, California: September 1980). Pp. 615.

**Note:** Domestic includes all traffic within and between the fifty states;  
also U.S.-Canada transborder traffic. Traffic between mainland and  
U.S. Virgin Islands and Puerto Rico is classified as international.

<sup>1</sup> Local service carriers.

<sup>2</sup> Intra-Alaska, intra-Hawaii, other airlines not included elsewhere.

<sup>3</sup> Formerly intrastate carriers (until 1979) Air Florida, Air California,  
Pacific Southwest (PSA), and Southwest.

APPENDIX III-D

## APPENDIX III-D

### Domestic Carriers

Table III-D-1 shows domestic carriers by size for the years 1979, 1980, and 1981. The carriers are divided into domestic trunk lines and local service carriers. Note how on-flight passenger trip lengths have increased over time and revenue passenger enplanements have decreased over time for most of the major trunk carriers. In the local service carrier group, revenue passenger enplanements have increased slightly or remained about the same as they were in 1979 and again passenger trip lengths have increased.

TABLE III-D-1

## Domestic Carriers by Size

Domestic Trunk Line Carrier	Revenue Passenger Enplanements (000)			On-Flight Passengers Trip Length (miles)*		
	1979	1980	1981	1979	1980	1981
Eastern Airlines	42,724	39,494	35,666	635	715	731
Delta Air Lines	40,274	38,597	34,777	623	674	697
United Air Lines	35,373	38,358	28,690	1,041	1,171	1,197
American Air Lines	31,009	25,836	24,764	1,040	1,091	1,123
Trans World Airlines	22,574	20,398	17,989	1,046	1,378	1,430
Braniff International	14,353	12,153	10,452	746	979	846
Western Airlines	11,952	9,877	9,200	823	890	927
Northwest Airlines	11,636	11,501	11,144	862	850	877
Continental Air Lines	9,874	8,425	8,406	917	963	942
Pan American World Airways	9,275	15,217	13,540	1,870	1,983	2,135
National Airlines	6,582	-	-	1,102	-	-
<u>Local-Service Carrier</u>						
USAir 2/	14,060	14,213	13,405	359	385	405
Republic 1/	12,031	17,362	16,769	306	403	451
Frontier Airlines	6,539	6,017	6,286	457	489	553
Piedmont Airlines	5,429	5,707	7,266	353	414	445
Hughes Air West	5,045	-	-	495	-	-
Texas International Airlines	4,441	4,345	3,762	492	516	573
Ozark Air Lines	4,034	3,847	4,159	385	409	448

Source: U.S. Civil Aeronautics Board, Air Carrier Traffic Statistics (Washington, D.C.: December 1979), and Air Transport Association, Air Transport 1980 (Washington, D.C.: 15 June 1980).

\* Scheduled services

1/ Merged with Hughes Air West 10/80; Republic's surviving company; shown as a major airline in 1980 and 1981, (i.e., revenues \$1 billion +).

2/ Shown as a major airline in 1980 and 1981.

APPENDIX III-E

## APPENDIX III-E

### Employment

Since 1970, total industry employment for the airlines has fluctuated around 300,000 employees per year, except for the years 1979 and 1980, where that figure rose to approximately 340,000 employees per year. Table III-E-1 shows employment for the period 1977 to 1981 for the industry, separated by full and part-time employees and for the different carrier groups including Majors, Nationals, Regional carriers and All Cargo carriers. The table shows dramatic decreases in employment from 1980 to 1981. For the industry as a whole, full-time employment decreased approximately 13 percent from 1980 to 1981 with the number of part-time employees decreasing approximately 20 percent. From the table it appears that significant decreases in employment occurred for Nationals and Regionals. However, the table is misleading in one respect. In each year, it shows employment by carrier grouping. However, in the last few years there has been significant switching by airlines into and out of carrier groups, so a strict comparison of carrier groupings does not hold constant specific airlines, year by year.<sup>1</sup>

Tables III-E-2 and III-E-3 address the impact of these changes in labor on the industry. Labor output ratios are calculated for the industry as a whole and for each of the Major carrier groupings and presented over time. Table III-E-2 shows the data in actual units while Table III-E-3 indexes the data.

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<sup>1</sup> One can detect from the table that a significant decrease in employment in the National and Regional groupings has occurred in the last two years. However, it is not clear from the table that the individual airlines that made up these categories had significantly suffered. The information provided in the table that applies to the industry as a total and to the All Cargo carriers is more significant and straightforward in what it represents.

TABLE III-E-1

## Employment

	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Industry Total					
Number of Full-time Employees	302,649	311,198	342,386	340,931	296,683
Number of Part-time Employees	10,857	14,052	14,968	14,040	11,215
Majors					
Number of Full-time Employees	278,783	284,201	307,678	291,985	277,660
Number of Part-time Employees	9,879	12,515	13,299	10,888	10,150
Nationals					
Number of Full-time Employees	17,366	19,004	26,039	34,981	18,550
Number of Part-time Employees	605	835	1,089	2,002	1,044
Regionals					
Number of Full-time Employees	949	872	1,484	6,907	473
Number of Part-time Employees	24	42	32	521	21
All Cargo					
Number of Full-time Employees	5,551	7,121	7,185	7,058	6,411
Number of Part-time Employees	349	660	548	629	435

Source: I.P.Sharp, CAB Form 41

TABLE III-E-2

**Labor Output Ratios<sup>1</sup>**  
**(Available Seat Miles Per Employee, Except Where Noted)**  
**(Thousands)**

	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Airline Industry	1,193.6	1,224.5	1,238.1	1,287.6	1,452.5
<u>Major Carrier Groups</u>					
Majors	1,243.8	1,282.4	1,285.4	1,370.4	1,366.5
Nationals	797.6	840.3	1,045.8	1,045.8	2,518.3
Regionals	366.0	396.5	783.5	314.8	8,850.8
Cargos <sup>2</sup>	476.2	445.1	458.6	498.5	498.9

<sup>1</sup> Based on full-time employment only.

<sup>2</sup> Available ton mile/employee.

Source: I.P. Sharp, CAR Form 41

TABLE III-E-3

Labor Output Ratios<sup>1</sup>  
(Available Seat Miles Per Employee, Except Where Noted)  
(1977 = 100)

	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Airline Industry	100.0	102.6	103.7	107.9	121.7
<u>Major Carrier Groups</u>					
Majors	100.0	103.1	103.3	110.2	109.9
Nationals	100.0	105.4	131.1	131.1	315.7
Regionals	100.0	108.3	214.1	85.8	2,418.0
Cargos <sup>2</sup>	100.0	93.5	96.3	104.7	104.8

<sup>1</sup> Based on full-time employment only.

<sup>2</sup> Available ton mile/employee.

Source: I.P. Sharp, CAB Form 41

which shows the data in index form, shows that cargoes showed a relatively steady increase from 1978 through 1981 with the difference between 1981 over 1980 being a very small increase. This is quite different than for the industry as a total which showed a relatively large increase from 1980 to 1981 and tremendous increases in both carrier groups, the Nationals and the Regionals, with a slight decline for the Majors. However, one must be cautioned again that much of the change in 1981 from 1980 comes about from individual airlines switching carrier classes, more so than it does from tremendous increases in additional capacity during that one-year period.

APPENDIX III-F

## APPENDIX III-F

### Travel Agencies

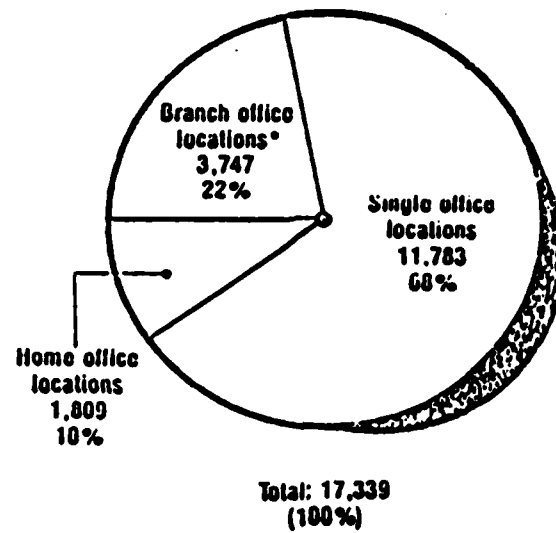
In September of 1981, 18,712 travel agencies reported sales through the Air Traffic Conference System, up from a 1980 year-end figure of 17,339, and 14,804 in 1978. Single-office locations represented more than two-thirds of all the agencies in 1980 with branch office locations accounting for about 22 percent of the total (see Chart III-F-1). Agencies with branch offices within corporate organizations grew the fastest over the last few years, from 12 in 1979 to 234 by September of 1981. The best available measure of dollar volume for travel agencies comes from the Air Traffic Conference (ATC) statistics on airline ticket sales. In 1980, airline sales through travel agencies exceeded \$18 billion, a 22 percent increase over 1979. At the end of September, 1981, this volume was \$15.25 billion, or twelve percent greater than the comparable total for 1980 (see Table III-F-1).

According to a survey conducted by Louis Harris Associates in 1981 for the Hotel and Travel Index, the average commercial agency has a gross dollar volume of \$1.65 million annually, with business travel generating approximately 65 percent of its sales. Chart III-F-2 below shows a breakdown of dollar volume for the average agency. Pleasure travel accounts for 26 percent with combined business/pleasure, about 9 percent of the total. Approximately 69 percent of the sales are for domestic travel and 31 percent for international travel. Commercial agencies attribute almost three-quarters of their dollar volume to air-travel arrangements.

The most important findings revealed a rapid increase in the volume and number of corporate accounts handled by travel agencies. The most significant area of growth for travel for business purposes was in group sales, where 40

CHART III-F-1

TYPE OF TRAVEL AGENCY LOCATIONS 1980



\*Includes 84 inplant locations versus 12 at the end of 1979.  
Source: Air Traffic Conference

TABLE III-F-1

## Travel Agency Sales Statistics 1980

	<u>1979</u>	<u>1980</u>	<u>% Change</u>
Air sales reported to ATC	\$14.7 billion	\$18.0 billion	22.0
Commissions paid by U.S. airlines	\$ 1.2 billion	\$ 1.5 billion	30.0
Average commission per	8.4%	8.9%	-
Average weekly sales report transaction	\$17,874	\$20,382	14.0
Gross dollar volume of credit card sales	\$ 4.0 billion	\$ 5.3 billion	32.0
Credit card sales as % of total bookings	27.4%	29.4%	-

Source: Travel Market Yearbook

percent of the respondents to the survey noted an increase in either meetings, conventions, or incentive-group bookings.

Through 1980 and 1981 the commissions paid on airline sales to agencies rose at rates faster than the gross dollar volume of air-travel bookings. In 1980, commissions were approximately \$1.5 billion, 30 percent higher than 1979. This reflects an average compensation rate of 8.9 percent per transaction, up from 8.4 percent in 1979. Commissions in the first nine months of 1981 totaled \$1.4 billion, a 23 percent increase over the same period in 1980. The average commission rate per transaction hit a 9.9 percent all-time high in October, 1981 (see Table III-F-1).

Table III-F-2 below shows the number of travel agencies by state for the years 1980 and 1981 with the percentage change. Texas, Georgia, Delaware, Colorado, and New Mexico show the largest percentage change in the number of agencies over the period, while New York, West Virginia, and Wyoming show declines from 1980 to 1981. The average increase in the number of agencies was 6.1 percent for all the states combined over the period August, 1980 to August, 1981.

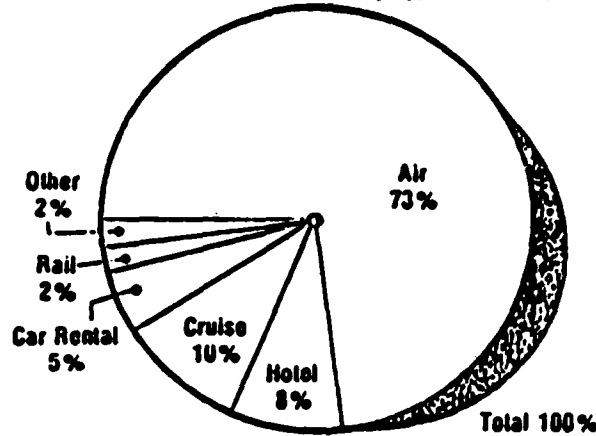
Table III-F-3 below shows the use of travel agents for air and lodging bookings by traveler type for the period 1978-1980. It is clear that in terms of air travel, agent bookings for domestic pleasure and domestic business increased over the three-year period. Agent-booked international air travel declined significantly over this period. The breakdown for trips involving the use of a travel agent is shown in Chart III-F-3. Of a total of 82 million trips that were booked by travel agent, 48 percent involved domestic business trips, 28 percent domestic pleasure trips, with domestic personal trips and international trips accounting for the remaining eighteen percent. Table III-F-4 shows domestic-traveler usage of travel agents broken out by sex and

# **TRAVEL AGENTS WHO SPECIALIZE IN BUSINESS TRAVEL\***

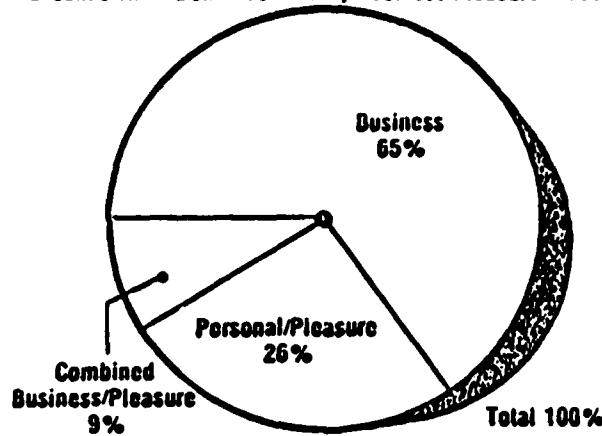
Sources of Total Dollar Volume

Average agency's  
gross dollar volume (FY 1981) .....\$1.65 million

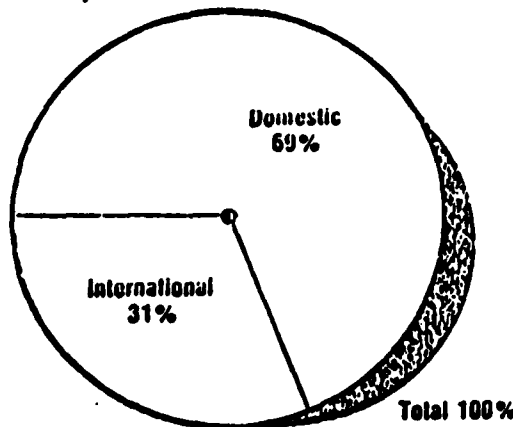
Breakdown of Dollar Volume by Type of Booking



Breakdown of Dollar Volume by Business/Pleasure Travel



Breakdown of Dollar Volume  
by Domestic/International Travel



\*Business travel is defined as bookings made for corporate accounts, independent business travelers, and groups traveling to business meetings, conventions, and on incentive trips. To qualify as a business travel specialist, at least 60% of the agents' total dollar volume must come from business travel bookings.

Source: Travel & Tourism Industry Association of America, Inc. (TTA) Survey of Travel Agents, 1981.

TABLE III-F-2

## Number of Travel Agencies by State, 1981\*

	1980	1981	% Change
Alabama	71	85	13.3
Alaska	63	64	1.9
Arizona	232	264	13.8
Arkansas	46	50	8.7
California	3,391	3,700	9.1
Colorado	278	321	15.5
Connecticut	478	490	2.5
Delaware	34	40	17.6
District of Columbia	163	164	7.2
Florida	1,164	1,234	6.0
Georgia	189	223	18.0
Hawaii	249	260	4.4
Idaho	42	42	—
Illinois	1,135	1,179	3.9
Indiana	220	224	1.8
Iowa	137	146	6.6
Kansas	100	110	10.0
Kentucky	74	78	5.4
Louisiana	129	141	9.3
Maine	64	65	1.6
Maryland	218	229	5.0
Massachusetts	663	679	2.4
Michigan	519	541	4.2
Minnesota	270	295	9.3
Mississippi	50	51	2.0
Missouri	245	265	8.2
Montana	54	55	1.9
Nebraska	62	62	—
Nevada	82	90	9.8
New Hampshire	81	83	2.5
New Jersey	880	1,037	4.9
New Mexico	58	67	15.5
New York	2,736	2,699	-1.3
North Carolina	124	148	19.4
North Dakota	32	36	12.5
Ohio	532	556	4.5
Oklahoma	123	131	6.5
Oregon	205	235	14.6
Pennsylvania	825	845	2.4
Rhode Island	99	104	5.1
South Carolina	59	64	8.5
South Dakota	20	20	—
Tennessee	132	144	9.1
Texas	772	922	19.4
Utah	27	87	13.0
Vermont	30	41	5.1
Virginia	201	232	15.4
Washington	400	421	5.3
West Virginia	35	34	-2.9
Wisconsin	208	296	3.5
Wyoming	33	32	-3.0
<b>TOTAL</b>	<b>18,282</b>	<b>19,389</b>	<b>6.1</b>

\* As of August 1981 compared to August 1980.

Source: World Travel Directory

TABLE III-F-3

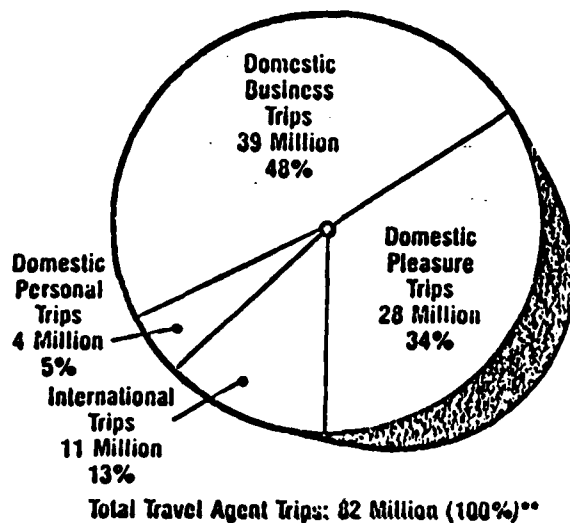
Use of a Travel Agent for  
Air and Lodging Reservations  
(By Traveler Type)\*

	Air Travel		Lodging	
	1978-79	1979-80	1978-79	1979-80
	%	%	%	%
<b>Domestic Pleasure</b>				
Agent booked	40	51	17	20
Agent selected	26	41	9	20
<b>Domestic Business</b>				
Agent booked	37	53	14	22
Agent selected	25	43	10	13
<b>International</b>				
Agent booked	69	5	61	69
Agent selected	51	62	44	55

\* Based on users of travel agent services who booked fully/partially in advance. See page 66 for definitions of traveler types as they apply to Travel Pulse research.

Source: Travel Pulse Research Service 1979-80.

**Trips Involving Use  
of Travel Agent  
(By Trip Type)\***



\* See page 66 for definitions of trip types as they apply to Travel Pulse research.

\*\* The 82 million trips involving travel agent usage represent 26% of the 316 million trips recorded in 1970-80 by Travel Pulse Research Service.

Source: Travel Pulse Research Service 1979-80.

TABLE III-F-4

## Domestic Pleasure Traveler Usage of Travel Agents\*

	Total	Male	Female	Age 18-34	Age 35-54	Age 55 and over	Income Under \$25,000	Income \$25,000 and over
% used a travel agent	74	71	77	62	80	74	70	76
	(100) %	(100) %	(100) %	(100) %	(100) %	(100) %	(100) %	(100) %
<b>RESERVATIONS</b>								
Transportation	96	98	95	95	97	99	96	96
Accommodations	86	86	86	89	89	78	81	90
Car Rental	26	23	28	24	27	25	25	29
Tickets to local events	9	4	13	6	12	7	10	10
Provided maps	9	6	11	11	10	7	8	9
<b>ADVICE</b>								
Helped select airline	53	47	57	52	51	58	48	58
Helped select hotel	44	37	49	41	45	45	35	50
Best rates on transportation/ accommodations	41	33	47	51	43	29	27	48
Provided information on destinations	29	20	35	29	33	21	21	34

\* Based on responses of past year domestic pleasure travelers who had taken a trip of 100 miles or more which included air fare or paid accommodations.

Source: Travel Pulse Research Service, August 1980.

age group as well as income level. Note that more females use travel agents than do males, and age groups 35-54 use travel agents more than do younger and older travelers. Also, it appears from the table that those in income brackets in excess of \$25,000 a year use travel agents more than those earning less than \$25,000 a year. However, it is also clear from the table that of those different percentages of the traveling public that use a travel agent, a very high proportion uses them to book transportation, in all cases, in excess of 95 percent.

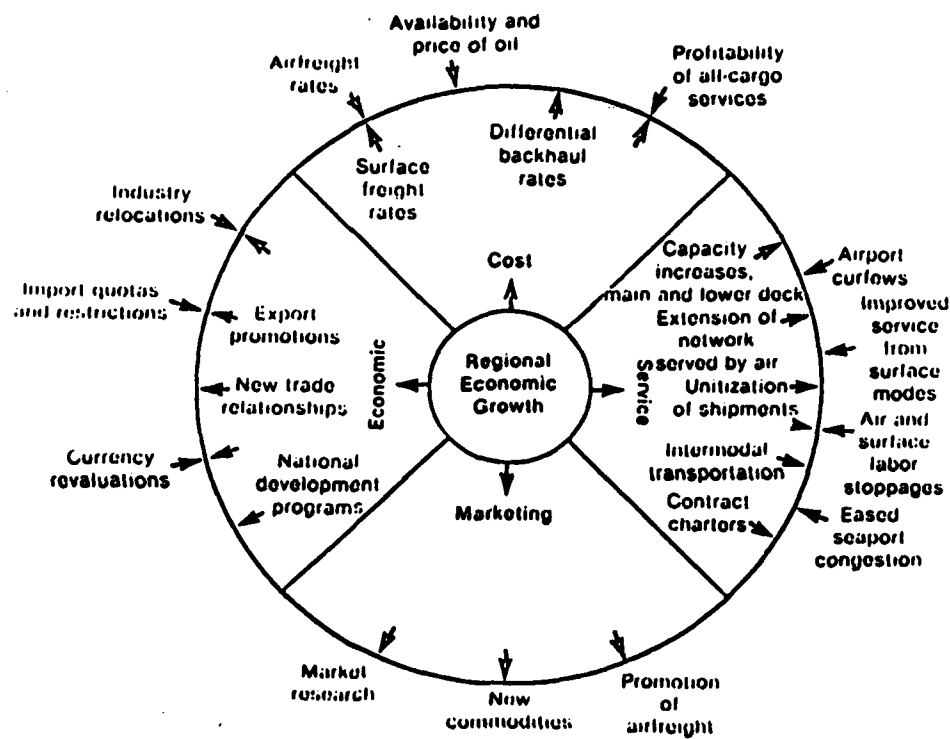
APPENDIX III-G

#### APPENDIX III-G

As a means of categorizing these and other factors, the Boeing Commercial Airplane Company separates them into two groups -- stimulants and constraints, with each group further subdivided into four areas: economic, cost, service, and marketing as shown in Figure III-G-1 below. The purpose of providing this particular type of categorization of the forces and constraints on air freight growth is to help the reader to generate alternative categories of potential problems that may affect the air freight growth in the future. That is, by separating these factors into economic factors versus marketing, cost, and service, one can begin to generate scenario-specific questions that are of importance to understanding the various combinations and complications that may affect air freight growth. In other words, this type of delineation allows one to ask smart questions about the potential impact of future alternative conditions within the air freight industry. Obviously, an examination of Figure III-G-1 shows that there are different combinations of impacts that could occur simultaneously and probably other combinations that could not.

FIGURE III-6-1

Forces and Constraints on Airfreight Growth



Source: Boeing Commercial Airplane Company, "Dimensions of Airline Growth" (March 1980), p.40.

APPENDIX III-H

#### APPENDIX III-H

In the PS-80, the CAB allowed costs to fluctuate 10 percent above to 70 percent below the existing DPFI coach fare. The Airline Deregulation Act ratified PS-80's own original fare flexibility concept but established a slightly different method for determining the ceiling fare. The basic fare for SIFL was given by the following formula:

\$16.16 + 8.84 ¢ per mile (0-500 miles)  
+ 6.74 ¢ per mile (501-1,500 miles)  
+ 6.48 ¢ per mile (over 1,500 miles)

After passage of the Airline Deregulation Act, the SIFL was continuously updated to reflect the increase in airline cost, particularly fuel costs. The CAB also issued multiple permissive awards where all applicants were granted authority to operate in a market whether they actually intended to or not. This had the impact of allowing the U.S. trunk and local service carriers to operate in over 100,000 city pairs by the spring of 1980. One impact of this policy was to cause carriers to shift toward longer-haul market service. As a result, the CAB proposed several changes to its fare policies during the period of transition to deregulation. The following alternatives were proposed by the CAB for domestic fare flexibility:

1. Full downward flexibility in all markets.
2. Ten percent upward flexibility in two and three carrier markets.
3. Full upward flexibility for markets up to 200 miles and 30 percent or more upward for 200 to 400 mile markets.
4. Full upward flexibility for a portion of each carrier's capacity each week in each market.

5. Thirty percent upward flexibility in all markets (or 50 percent for 0 to 200 or 0 to 400 mile markets).
6. Full upward flexibility in all markets.

On the positive side, the use of SIFL protected the consumer from potential monopoly power abuses. However, on the negative side, it was biased in favor of long-haul markets and served as a practical disincentive to innovative pricing. In June of 1980, PS-94, a CAB interim policy statement, was issued in which the fare structure was broadened. Full downward flexibility in all markets was provided. Full upward flexibility in 0 to 200 mile markets was also provided, as was up to 50 percent above SIFL in 200 to 400 mile markets and 30 percent above SIFL for lights over 400 miles. The formula as of January 1, 1982 was:

\$29.64 + 16.21 ¢ per mile (0-500 miles)  
+ 12.36 ¢ per mile (501-1,500 miles)  
+ 11.89 ¢ per mile (over 1,500 miles)

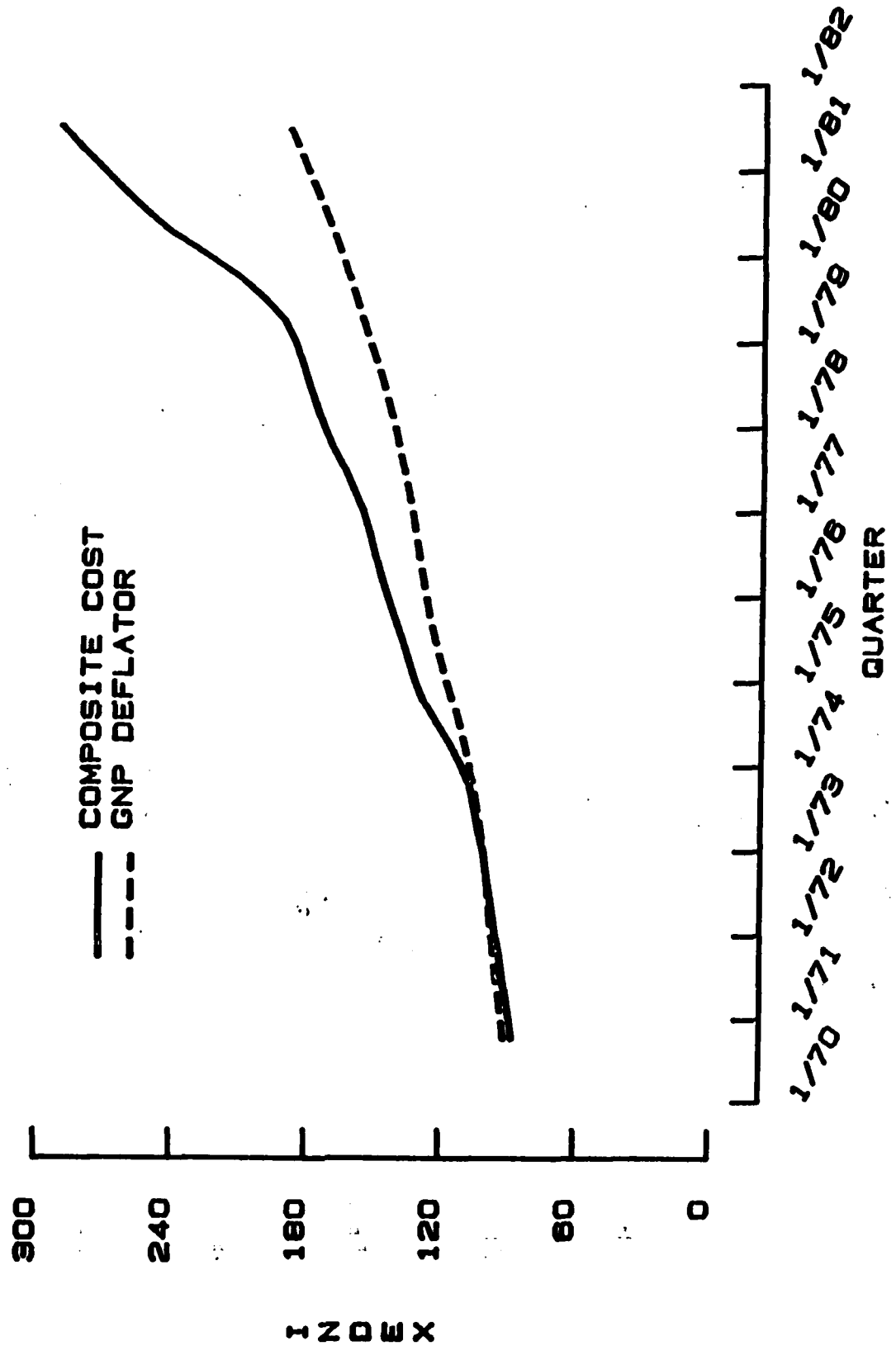
APPENDIX III-I

### APPENDIX III-I

Figure III-I-1 below shows cost changes calculated as a four quarter moving average for system trunks and local service carriers over the period 1970 to 1981 comparing the composite cost index for the airlines with the GNP deflator. The GNP deflator is the cost index used to determine the real GNP adjusted for inflation. It is used as a comparison here with the composite cost index and with the individual cost indexes in order to show how the individual and composite costs within the airline industry have tracked with the general trends in the economy as represented by the GNP deflator. Note how the composite cost index closely tracks the GNP deflator until 1974 and then begins to increase at a much higher rate than does the GNP deflator. Figure III-I-2 shows labor costs relative to the GNP deflator and Figure III-I-3 compares fuel costs, commissions and the deflator. Note the dramatic increase in fuel costs beginning in 1974, continuing to climb from 1975 through 1979 and then another dramatic increase from 1979 through the end of 1981. Landing fees, maintenance material, and the GNP deflator are compared in Figure III-I-4. Figures III-I-5 and III-I-6 show interest costs and the GNP deflator and food, and advertising expenditures relative to the GNP deflator, respectively. Note in these latter two figures how the interest costs and food and advertising do not outpace the GNP deflator and indeed in some cases increase at a slower rate than does the GNP deflator. Thus, the rapid growth in airline costs, which outpaced general inflation between 1974 and 1980, resulted from rapid growth in labor and fuel costs and landing fees, the most important cost items.

FIGURE III-I-1

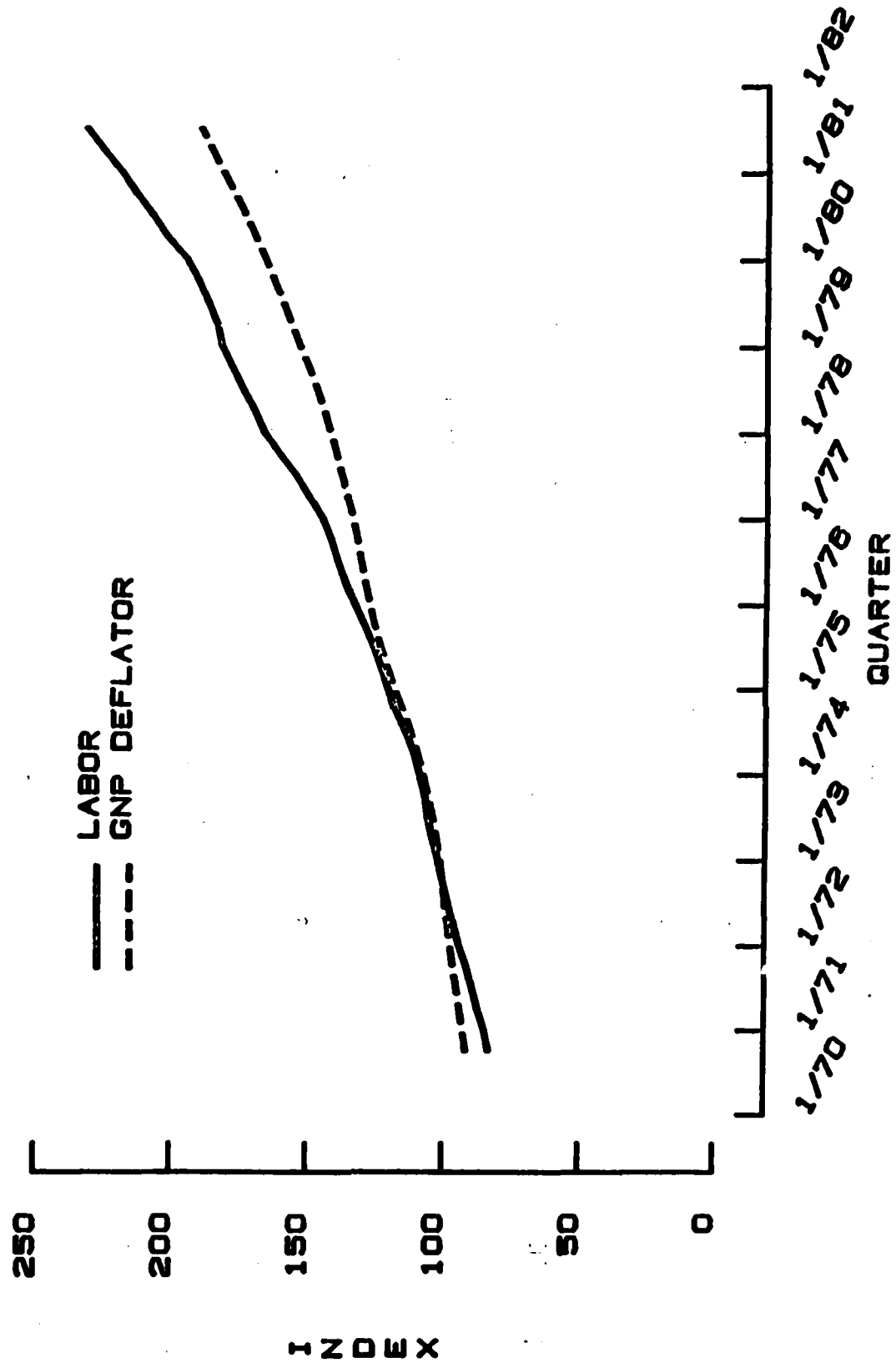
UNIT COST CHANGES  
(1972=100)  
4 QUARTER MOVING AVG  
SYSTEM TRUNKS  
LOCAL SERVICE CARRIERS



Source: Air Transport Association. Airline Cost Index. September 8, 1981

FIGURE III-I-2

UNIT COST CHANGES  
(1972=100)  
4 QUARTER MOVING AVG  
SYSTEM TRUNKS  
LOCAL SERVICE CARRIERS

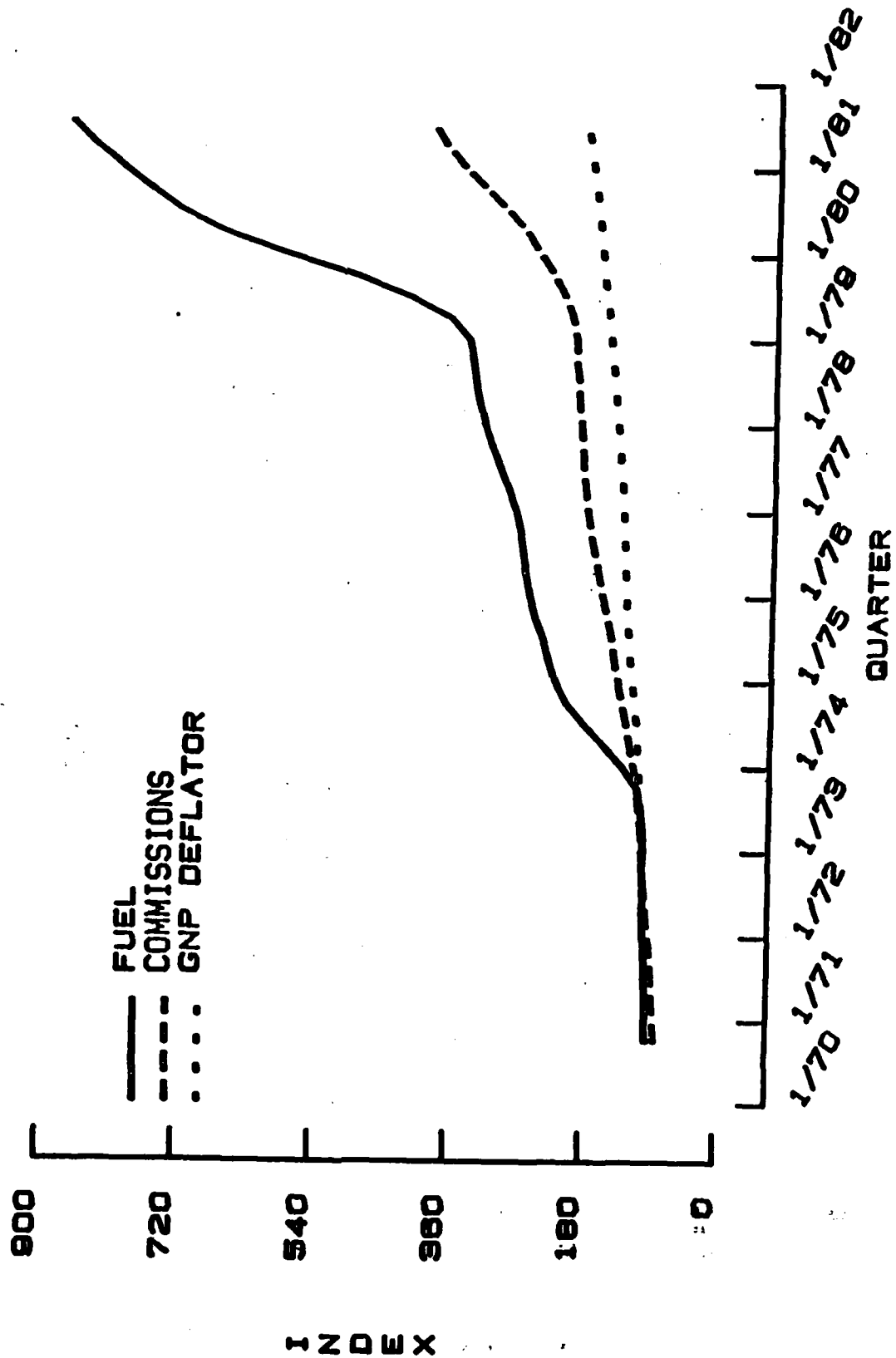


III-41

Source: Air Transport Association, Airline Cost Index, September 8, 1981.

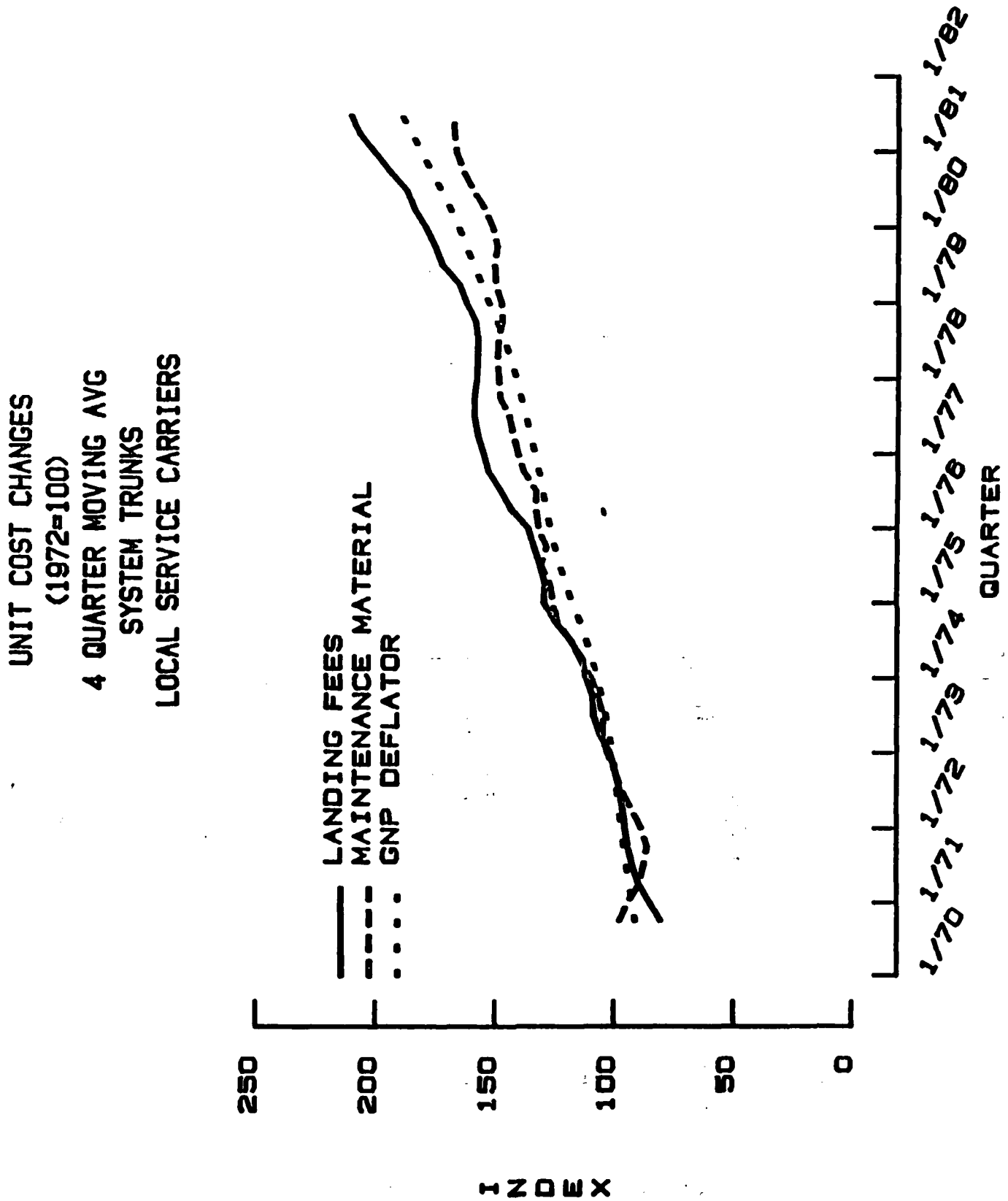
FIGURE III-1-3

UNIT COST CHANGES  
(1972=100)  
4 QUARTER MOVING AVG  
SYSTEM TRUNKS  
LOCAL SERVICE CARRIERS



Source: Air Transport Association, Airline Cost Index, September 8, 1981.

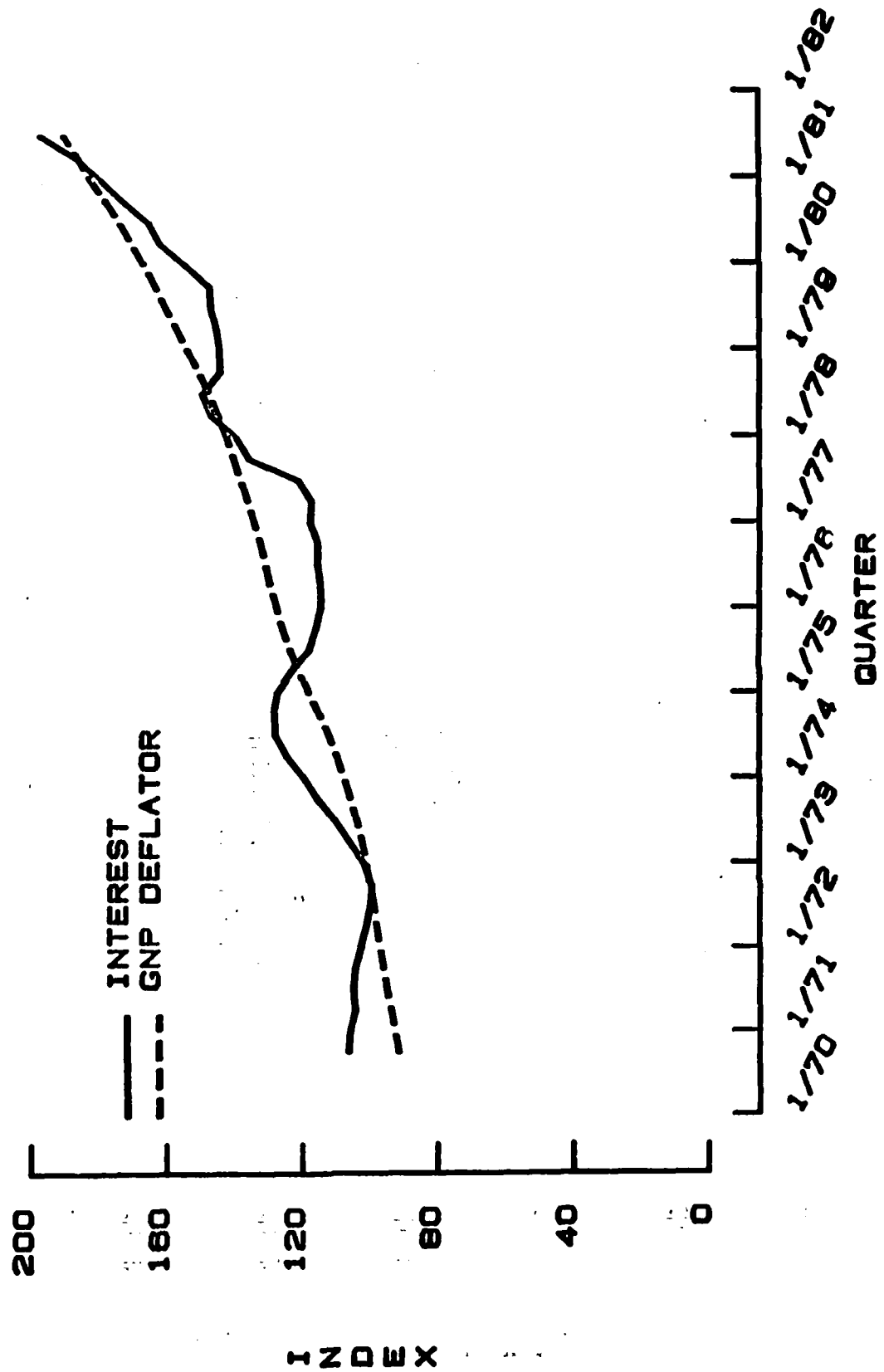
FIGURE III-T-4



Source: Air Transport Association, Airline Cost Index, September 8, 1981.

FIGURE III-I-5

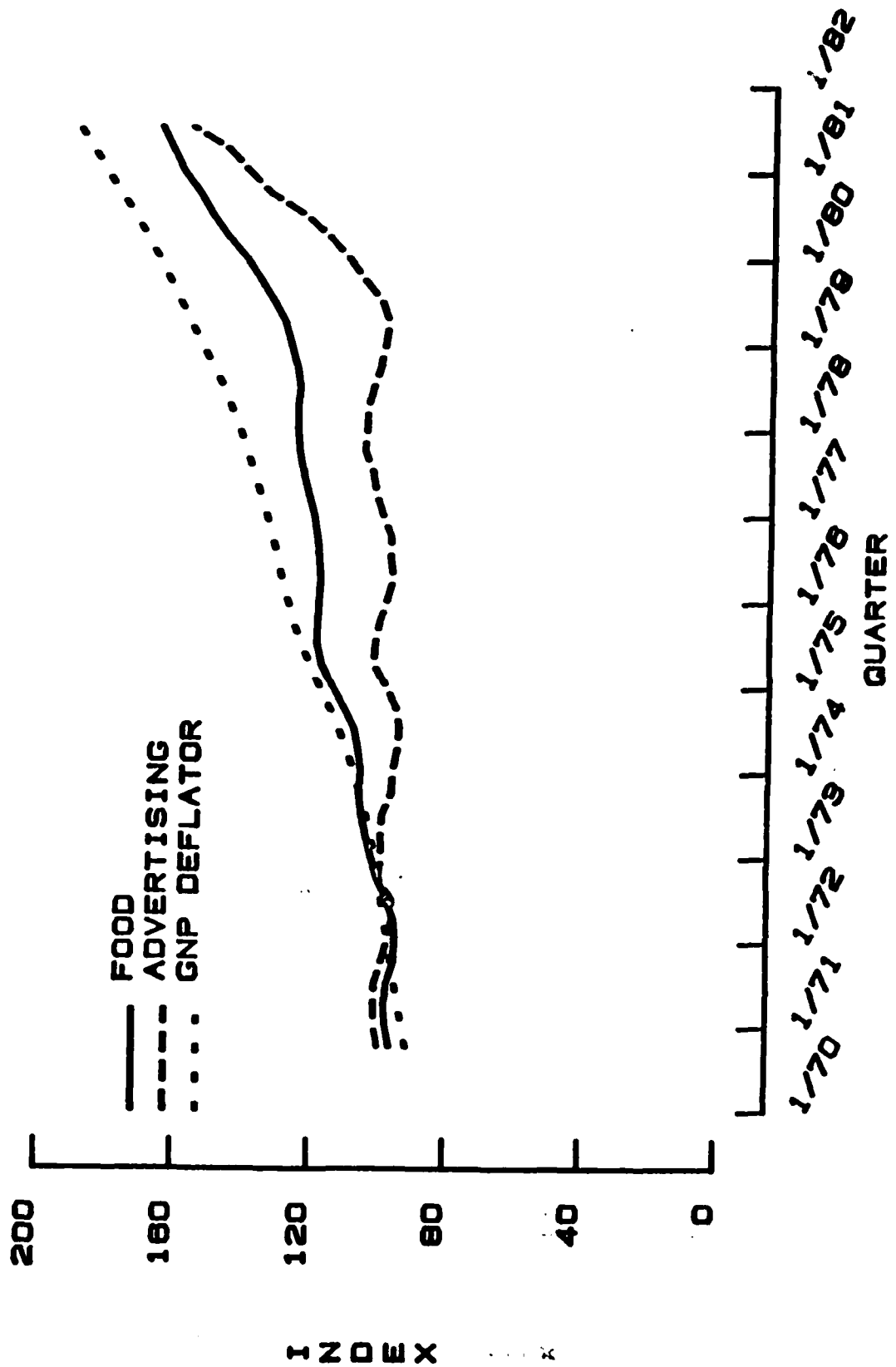
UNIT COST CHANGES  
(1972=100)  
4 QUARTER MOVING AVG  
SYSTEM TRUNKS  
LOCAL SERVICE CARRIERS



Source: Air Transport Association, Airline Cost Index, September 8, 1981.

FIGURE III-1-6

UNIT COST CHANGES  
(1972=100)  
4 QUARTER MOVING AVG  
SYSTEM TRUNKS  
LOCAL SERVICE CARRIERS



Source: Air Transport Association, Airline Cost Index, September 8, 1981

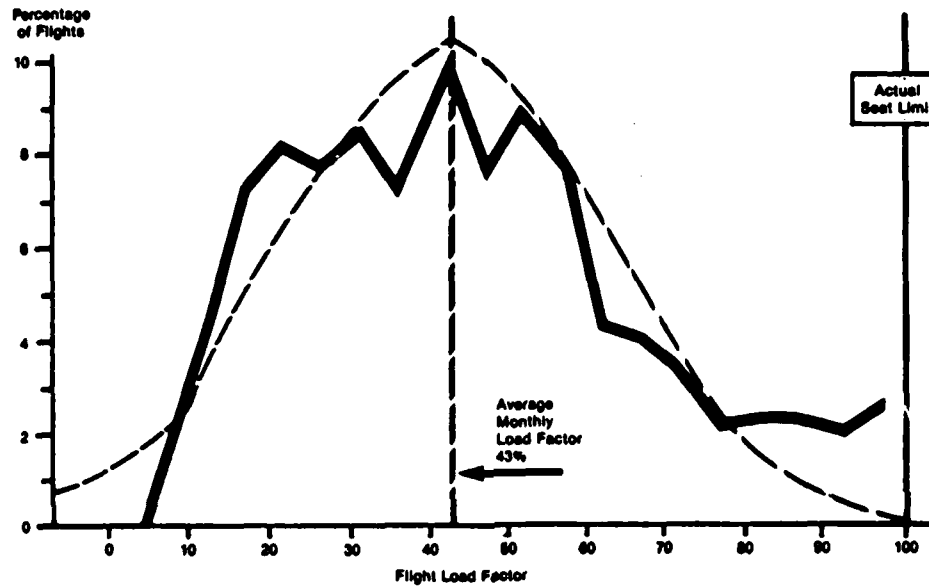
APPENDIX III-J

#### APPENDIX III-J

The Air Transport Association of America (ATA) prepared a detailed analysis of individual daily load factors for a specific month (August 1975). Although the peak season month at that point in time, the load factors presented there are now comparable to year-round averages (see Figures III-J-1 and III-J-2). The study showed how many passengers were denied tickets despite availability of seats at departure time for average load factors of about 60 percent. That is, it shows how many passengers attempted to buy tickets prior to boarding and were denied tickets because the plane was booked and then at departure time because of cancellations and no-shows there was additional capacity and more passengers could have been accommodated on the airplane. In one case, it showed that the monthly average load factor for the Chicago-Denver route was 66 percent. The distribution of that load factor approximated a normal (Bell) curve except for the right hand side of that normal curve which was cut short by the limited number of seats on the aircraft. That is, the distribution of load factors as shown in Figure III-J-3 below can be evaluated by superimposing normal distribution curve onto the actual load factor curve as done in Figure III-J-4 below to show the unaccommodated demand at the upper tail of the curve due to the actual seat limit of the airplane. The unaccommodated demand shows the passenger who desired to travel on the flight but could not be accommodated due to the flight being sold out. The level of unaccommodated demand increases with an increase in the "no-show" factor. Overbooking as a practice tends to reduce the problem of handling no shows and raise the load factor but even with the level of unaccommodated demand that exists on the flights shown in these

FIGURE III-J-1

### Significance of Passenger Load Factors

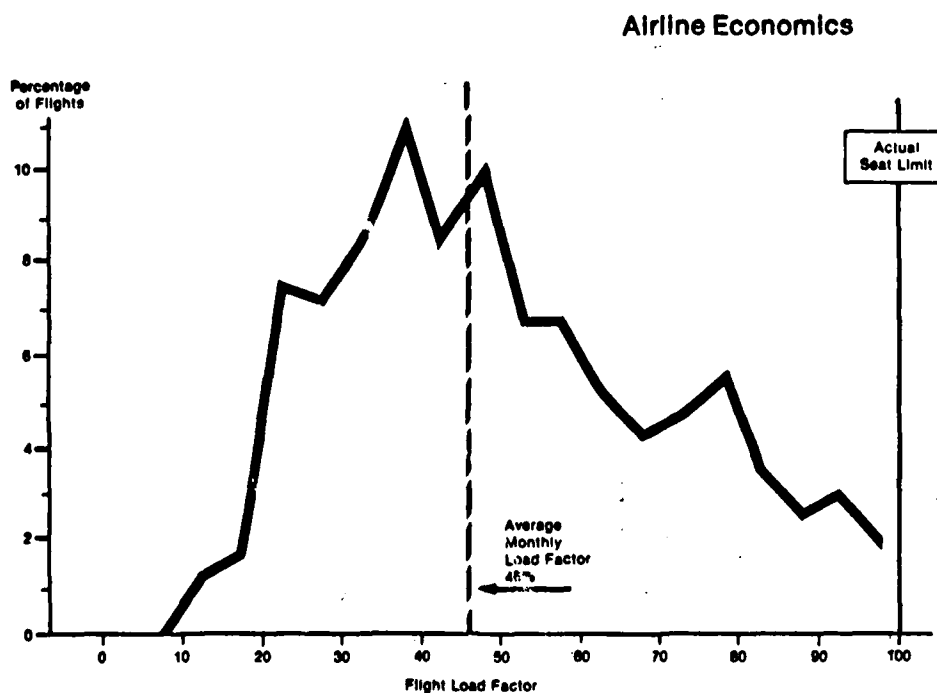


Source: CAB data.

Figure 3-7. Distribution of Load Factors, by Flights, Dallas-New Orleans Route.  
August 1975

Source: Air Transport Association of America, The Significance of Airline Passenger Load Factors, August 1980, p. 5.

FIGURE III-J-2



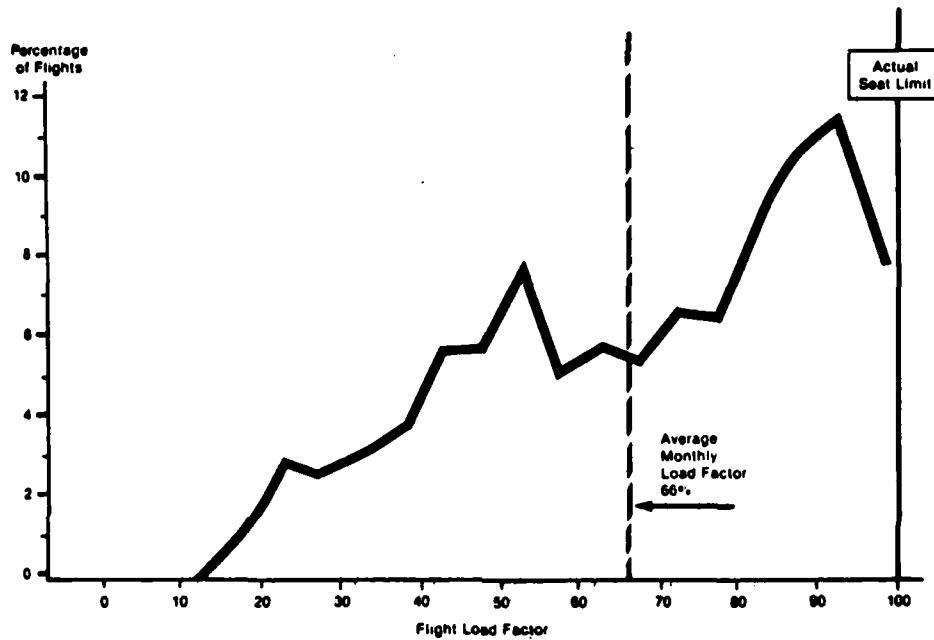
Source: CAB data.

**Figure 3-8. Distribution of Load Factors, by Flights, Miami-New York (JFK) Route, August 1975**

Source: Air Transport Association of America, The Significance of Airline Passenger Load Factors, August 1980, p. 5.

FIGURE III-J-3

Significance of Passenger Load Factors

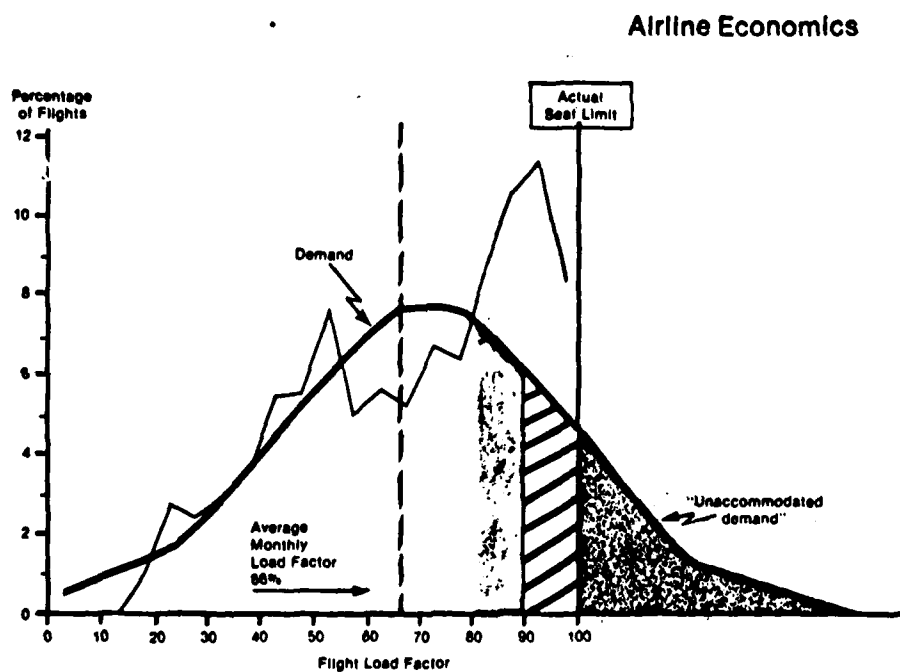


Source: CAB data.

Figure 3-9. Distribution of Load Factors, by Flights, Chicago-Denver Route, August 1975

Source: Air Transport Association of America, The Significance of Airline Passenger Load Factors, August 1980, p. 7, p. 9.

FIGURE III-J-4



Source: CAB data.

Figure 3-10. Distribution of Load Factors and Distribution of Demand, Chicago-Denver Route

Source: Air Transport Association of America, The Significance of Airline Passenger Load Factors, August 1980, p. 7, p. 9.

figures, the airline cannot take it upon itself to sell tickets to everyone because of the over-booking problem. It is clear from Figure III-J-4 that even though the average load factors of approximately 66 percent that almost 12 percent of the flights were undertaken with a load factor of 90 percent, ten percent of the flights with approximately 95 percent, etc. The purpose of this point of the discussion is to make the reader sensitive to the problem of altering load factors, "no-shows," and resulting unaccommodated demand and what impact that has on airline operating efficiency.

The study also showed that this problem becomes worse when considering the distribution of load factors by day of the week. For the same example used above, the average daily load factor varied from 59 percent on Wednesday to 72 percent on Sunday. In fact, on Sunday more than 25 percent of the flights departed with a 90 percent or higher load factor. The unaccommodated demand increases on heavily traveled days and it increases even more on the popular flights on the heavily traveled days (see Figure III-J-5).

Recently, carriers have attempted to deal with this high load factor/service/convenience problem through the introduction of capacity controlled fares; that is, fares that are offered for an overall percentage of the total capacity on a given route. Capacity-controlled fares are deep discount fares offered on a percentage of the total seats on a flight. The airline adjusts the percentage of these seats offered relative to the demand at normal fares in order to fill the seats which would otherwise be empty. This usually occurs during off-peak hours or days (i.e., weekdays only). This type of pricing is a refinement of the off-peak pricing concept that has been used by airlines for many years. It permits average load factors to be increased without increasing demand on heavily traveled days by allowing the

FIGURE III-J-5

### Significance of Passenger Load Factors

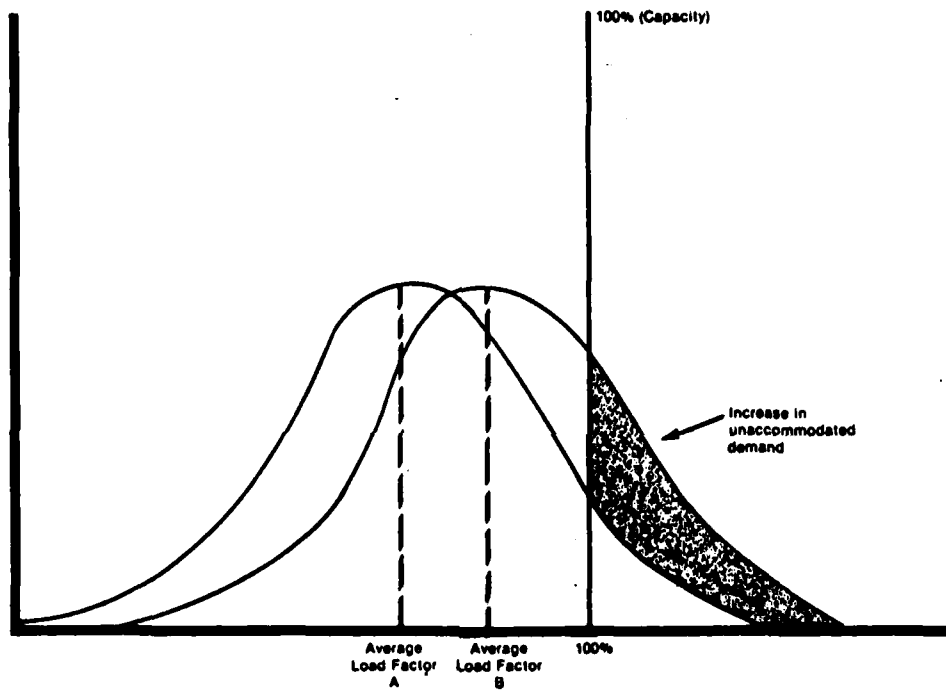


Figure 3-15. Distribution of Demand and Unaccommodated Demand for Two Average Load Factors

Source: Air Transport Association of America, The Significance of Airline Passenger Load Factors, August 1980, p. 8.

airline to fill seats with passengers willing to travel on less popular days in exchange for some fare reduction. Until a few years ago, off-peak pricing was difficult to implement because these fares had to be specifically detailed in the promotional fare tariffs and resulted in too rigid a set of definitions for this widely varying concept. Capacity-controlled fares retained the idea of off-peak pricing but gave the airlines additional flexibility to make discounts available relative to demand fluctuations demonstrated by individual schedules on individual routes. Combined with computer technology reservations, a more sophisticated prediction of demand and the amount of space available on future individual flights could be made and unfilled seats promoted at a discount.

APPENDIX III-K

### APPENDIX III-K

The tables in this appendix provide detailed operating and cost data for each aircraft type over time. In addition to operating costs, such operating statistics as revenue passenger miles, available seat miles, load factors, and block hours are shown by aircraft type.

TABLE III-K-1

## B-747: Operating and Cost Statistics

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
<u>Scheduled Services</u> (Millions)												
Revenue Miles	52	152	177	190	158	160	175	199	208	242	259	243
Revenue Passenger Miles	8,739	21,593	28,697	31,728	28,049	26,363	30,606	33,884	39,466	47,976	49,825	48,316
Available Seat Miles	18,231	51,621	57,907	64,948	55,566	53,542	56,164	61,277	63,659	75,169	79,811	76,586
Passenger Load Factor (%)	48%	42%	50%	49%	50%	49%	54%	55%	62%	64%	62%	61%
Revenue Ton Miles	1,062	2,791	3,704	4,141	3,839	4,184	5,115	6,039	7,059	8,226	8,642	8,632
Available Ton Miles	2,910	8,373	9,533	10,316	8,939	9,231	10,232	11,746	12,185	14,171	15,164	14,606
Cargo Load Factor (%)	36%	33%	39%	40%	43%	45%	50%	51%	58%	58%	57%	59%
<u>All Services</u> (Millions)												
Revenue Miles	52	152	177	191	160	163	179	203	211	249	264	257
Revenue Passenger Miles	8,739	21,647	28,847	32,097	28,471	27,229	31,834	34,955	40,058	48,428	50,578	50,130
Available Seat Miles	18,239	51,690	58,080	65,365	56,084	54,662	57,660	62,474	64,315	75,686	80,912	78,714
Passenger Load Factor (%)	48%	42%	50%	49%	51%	50%	55%	56%	62%	64%	63%	64%
Revenue Ton Miles	823	2,791	3,719	4,178	3,881	4,286	5,248	6,166	7,178	8,349	8,907	9,053
Available Ton Miles	2,912	8,426	9,560	10,382	9,014	9,418	10,455	11,938	12,356	14,361	15,538	15,266
Cargo Load Factor (%)	28%	33%	39%	40%	43%	46%	50%	52%	58%	58%	57%	59%
Block Hours (Thousands)	116	335	389	421	349	356	391	438	456	523	561	551

Source: I.P. Sharp Associates, CAB Form 41.

Table III-K-1 (continued)  
B-747: Operating and Cost Statistics

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
<u>Operating Expenses</u> (Dollars per Block Hour)												
Pilots and Copilots	163	161	169	184	217	231	250	278	291	330	386	316
Other Flight Personnel	56	47	48	48	60	70	69	79	95	99	110	97
Aircraft Fuels and Oils	342	354	447	458	1,052	1,154	1,197	1,327	1,418	2,129	3,347	2,976
Total Flying Operations	1,080	992	953	1,027	1,774	1,920	2,012	2,080	2,109	2,900	4,200	3,598
Total Direct Maintenance	220	302	313	311	349	378	416	431	445	453	502	393
Total Aircraft Operating Expense	1,752	1,763	2,142	1,886	2,763	2,933	2,998	3,162	3,396	4,169	5,531	4,767

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-R-2

## DC-10: Operating and Cost Statistics

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
<u>Scheduled Services</u>											
(Millions)											
Revenue Miles	2	47	102	123	145	167	180	184	170	193	194
Revenue Passenger Miles	235	4,765	10,382	13,732	16,864	20,287	22,360	26,748	25,015	27,745	29,165
Available Seat Miles	463	10,543	23,736	28,793	34,121	39,859	44,111	46,832	43,464	50,203	50,821
Passenger Load Factor (%)	51%	45%	44%	48%	49%	51%	51%	57%	58%	55%	57%
Revenue Ton Miles	24	577	1,323	1,881	2,284	2,727	2,995	3,443	3,220	3,518	3,715
Available Ton Miles	65	1,617	3,659	4,593	5,406	6,145	6,681	6,873	6,446	7,197	7,305
Cargo Load Factor (%)	37%	36%	36%	41%	42%	44%	45%	50%	50%	49%	51%
<u>All Services</u>											
(Millions)											
Revenue Miles	2	47	102	123	146	168	181	186	171	195	195
Revenue Passenger Miles	235	4,778	10,419	13,805	17,024	20,520	22,623	27,082	25,261	28,388	29,701
Available Seat Miles	463	10,561	23,780	28,879	34,348	40,169	44,454	47,211	43,737	50,950	51,440
Passenger Load Factor (%)	51%	45%	44%	48%	50%	51%	51%	57%	58%	56%	58%
Revenue Ton Miles	26	578	1,327	1,888	2,300	2,750	3,021	3,478	3,244	3,582	3,769
Available Ton Miles	71	1,619	3,665	4,596	5,441	6,192	6,732	6,930	6,485	7,297	7,504
Cargo Load Factor (%)	37%	36%	36%	41%	42%	44%	45%	50%	50%	49%	50%
Block Hours (Thousands)	5	113	251	300	352	400	428	436	401	452	440

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-2 (continued)  
DC-10: Operating and Cost Statistics

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
<u>Operating Expenses</u> (Dollars per Block Hour)											
Pilots and Copilots	135	134	154	192	205	212	230	256	324	359	296
Other Flight Personnel	43	40	34	35	38	41	47	55	66	78	69
Aircraft Fuels and Oils	253	248	277	539	655	706	850	916	1,345	2,122	1,910
Total Flying Operations	841	632	706	1,049	1,129	1,172	1,320	1,430	1,968	2,834	2,523
Total Direct Maintenance	144	144	198	312	326	323	376	373	431	477	333
Total Aircraft Operating Expense	1,407	1,173	1,881	1,861	1,967	2,010	2,236	2,378	3,123	4,058	3,453

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-3  
L-1011: Operating and Cost Statistics

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
<u>Scheduled Services</u> (Millions)										
Revenue Miles	7	29	60	81	96	106	113	130	146	153
Revenue Passenger Miles	831	3,058	7,552	10,208	12,308	14,127	17,933	22,370	23,677	23,429
Available Seat Miles	1,485	6,576	14,379	19,972	24,038	26,806	30,556	36,991	41,225	43,004
Passenger Load Factor (%)	56%	47%	53%	51%	51%	53%	59%	60%	57%	54%
Revenue Ton Miles	96	364	925	1,276	1,548	1,768	2,201	2,716	2,847	2,890
Available Ton Miles	227	968	2,091	2,888	3,377	3,760	4,131	4,869	5,415	5,667
Cargo Load Factor (%)	42%	38%	44%	44%	46%	48%	53%	56%	53%	51%
<u>All Services</u> (Millions)										
Revenue Miles	7	29	60	82	97	106	113	130	146	154
Revenue Passenger Miles	831	3,093	7,628	10,303	12,434	14,182	17,941	22,373	23,680	23,444
Available Seat Miles	1,485	6,642	14,505	20,097	24,227	26,880	30,570	36,997	41,230	43,031
Passenger Load Factor (%)	56%	47%	53%	51%	51%	53%	59%	60%	57%	54%
Revenue Ton Miles	96	368	932	1,285	1,561	1,792	2,202	2,717	2,847	2,892
Available Ton Miles	227	977	2,109	2,907	3,401	3,770	4,133	4,870	5,416	5,670
Cargo Load Factor (%)	42%	38%	44%	44%	46%	48%	53%	56%	53%	51%
Block Hours (Thousands)	16	70	152	204	240	260	279	319	350	366

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-3 (continued)

L-1011: Operating and Cost Statistics

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
<u>Operating Expenses</u> (Dollars Per Block Hour)										
Pilots and Copilots	161	168	183	202	205	230	250	279	336	331
Other Flight Personnel	48	55	47	44	42	49	51	54	66	60
Aircraft Fuels and Oils	268	309	589	702	731	850	914	1,363	2,037	2,009
Total Flying Operations	811	913	1,179	1,271	1,276	1,450	1,435	1,932	2,687	2,619
Total Direct Maintenance	244	221	327	316	328	353	371	383	427	369
Total Aircraft Operating Expense	1,607	1,674	2,056	2,188	2,252	2,485	2,574	3,066	3,917	3,748

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-4

## A-300: Operating and Cost Statistics

	1977	1978	1979	1980	1981
<u>Scheduled Services</u>					
<u>(Millions)</u>					
Revenue Miles	.400	5	10	19	28
Revenue Passenger Miles	.046	.628	1	3	3
Available Seat Miles	.091	1	2	5	7
Passenger Load Factor (%)	51%	63%	50%	60%	43%
Revenue Ton Miles	5	74	169	315	431
Available Ton Miles	13	153	340	634	921
Cargo Load Factor (%)	38%	48%	50%	50%	47%
<u>All Services</u>					
<u>(Millions)</u>					
Revenue Miles	.400	5	10	19	28
Revenue Passenger Miles	.046	.628	1	3	3
Available Seat Miles	.091	1	2	5	7
Passenger Load Factor (%)	51%	63%	50%	60%	43%
Revenue Ton Miles	5	74	169	315	431
Available Ton Miles	13	153	340	634	921
Cargo Load Factor (%)	38%	48%	50%	50%	47%
Block Hours (Thousands)	1	14	28	52	72

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-4 (continued)

## A-300: Operating and Cost Statistics

	1977	1978	1979	1980	1981
<u>Operating Expenses</u> (Dollars per Block Hour)					
Pilots and Copilots	319	222	263	302	249
Other Flight Personnel	124	75	83	96	77
Aircraft Fuels and Oils	792	658	1,022	1,498	1,328
Total Flying Operations	1,458	1,093	1,546	2,089	1,808
Total Direct Maintenance	105	147	240	240	186
Total Aircraft Operating Expense	1,649	1,604	2,282	2,887	2,396

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-5

## B-727: Operating and Cost Statistics

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
<u>Scheduled Services</u> (Millions)														
Revenue Miles.	294	658	672	699	724	777	779	804	872	957	1,037	1,221	1,256	1,181
Revenue Passenger Miles	15,952	34,830	35,838	38,107	41,530	45,002	49,648	51,408	57,687	64,967	78,301	96,110	92,058	88,449
Available Seat Miles	28,837	66,041	68,668	73,506	74,888	82,141	85,002	89,499	100,153	112,576	124,762	149,786	156,006	153,160
Passenger Load Factor (%)	55%	53%	52%	52%	55%	55%	58%	57%	58%	58%	63%	64%	59%	58%
Revenue Ton Miles	1,855	4,033	4,305	4,420	4,941	5,290	5,657	5,748	6,381	7,161	8,566	10,422	9,982	9,592
Available Ton Miles	4,003	9,244	9,593	9,954	10,286	11,190	11,423	11,936	13,128	14,570	16,097	19,343	20,211	19,551
Cargo Load Factor (%)	46%	44%	45%	44%	48%	47%	50%	48%	49%	49%	53%	54%	49%	49%
<u>All Services</u> (Millions)														
Revenue Miles	297	667	680	716	734	787	787	810	877	962	1,045	1,226	1,260	1,184
Revenue Passenger Miles	15,952	34,830	35,838	38,612	42,203	45,666	50,201	51,887	58,080	65,371	78,869	96,564	92,410	88,795
Available Seat Miles	29,151	66,765	69,409	74,252	75,885	83,126	85,814	90,192	100,733	113,175	125,499	150,385	156,498	153,617
Passenger Load Factor (%)	55%	52%	52%	52%	56%	55%	58%	58%	58%	58%	63%	64%	59%	58%
Revenue Ton Miles	1,855	4,033	4,305	4,613	5,016	5,361	5,716	5,798	6,421	7,202	8,642	10,461	10,018	9,627
Available Ton Miles	4,047	9,351	9,698	10,241	10,426	11,327	11,532	12,027	13,203	14,645	16,189	19,418	20,276	19,612
Cargo Load Factor (%)	46%	43%	44%	45%	48%	47%	50%	48%	49%	49%	53%	54%	49%	49%
Block Hours (Thousands)	848	1,918	1,896	1,974	2,043	2,219	2,208	2,208	2,463	2,595	2,915	3,400	3,454	3,248

Source: I.P. Sharp Associates, CAB Form 41.

TABLE I-I-K-5 (continued)  
B-727: Operating and Cost Statistics

Operating Expenses (Dollars Per Block Hour)	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Pilots and Copilots	148	84	96	105	109	120	136	154	160	175	187	212	255	250
Other Flight Personnel	34	21	25	27	29	27	32	35	34	36	35	30	38	35
Aircraft Fuels and Oils	248	139	147	154	155	167	286	369	391	454	502	734	1,088	1,011
Total Flying Operations	584	333	373	397	403	427	574	688	721	819	852	1,116	1,501	1,450
Total Direct Maintenance	177	88	97	93	97	98	108	115	118	121	121	125	125	113
Total Aircraft Operating Expense	1,012	562	639	659	672	703	890	1,014	1,045	1,151	1,213	1,486	1,978	1,805

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-6

## B-737: Operating and Cost Statistics

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
<u>Scheduled Services</u> (Millions)														
Revenue Miles	14	68	95	94	101	109	104	100	107	112	126	152	186	221
Revenue Passenger Miles	654	3,256	4,611	4,692	5,306	5,790	5,899	5,500	5,991	6,501	7,838	9,896	12,093	14,722
Available Seat Miles	1,288	6,497	8,820	8,722	9,414	10,230	9,907	9,511	10,170	10,704	12,379	15,874	20,246	24,994
Passenger Load Factor (%)	51%	50%	52%	54%	56%	57%	60%	58%	59%	61%	63%	62%	60%	59%
Revenue Ton Miles	69	344	515	521	590	644	655	612	665	713	856	1,057	1,247	1,552
Available Ton Miles	152	767	1,094	1,100	1,192	1,278	1,216	1,170	1,250	1,312	1,467	1,886	2,518	3,037
Cargo Load Factor (%)	45%	45%	47%	47%	49%	50%	54%	52%	53%	54%	58%	56%	50%	51%
<u>All Services</u> (Millions)														
Revenue Miles	14	68	95	94	101	109	104	101	107	113	126	153	191	226
Revenue Passenger Miles	654	3,256	4,611	4,720	5,338	5,806	5,909	5,523	6,016	6,528	7,876	10,006	12,450	15,072
Available Seat Miles	1,291	6,504	8,855	8,780	9,480	10,266	9,929	9,556	10,217	10,754	12,450	16,013	20,716	24,994
Passenger Load Factor (%)	51%	50%	52%	54%	56%	57%	60%	58%	59%	61%	63%	62%	60%	60%
Revenue Ton Miles	69	344	515	524	593	645	656	614	668	716	860	1,069	1,329	1,613
Available Ton Miles	152	768	1,098	1,107	1,206	1,282	1,289	1,179	1,256	1,319	1,476	1,902	2,598	3,104
Cargo Load Factor (%)	45%	45%	47%	47%	49%	50%	51%	52%	53%	54%	58%	56%	51%	52%
Block Hours (Thousands)	57	258	337	315	337	365	351	336	359	379	426	522	621	721

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-6 (continued)  
B-737: Operating and Cost Statistics

	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
<u>Operating Expenses</u> (Dollars Per Block Hour)														
Pilots and Copilots	88	88	99	111	113	116	134	153	159	167	182	191	203	164
Other Flight Personnel	.14	.65	13	19	19	18	22	23	21	20	15	10	10	11
Aircraft Fuels and Oils	91	101	105	112	113	117	197	256	278	314	337	480	739	685
Total Flying Operations	232	248	286	320	326	335	451	541	581	640	674	825	1,107	994
Total Direct Maintenance	75	77	84	84	79	81	110	123	148	143	137	152	178	131
Total Aircraft Operating Expense	444	464	514	555	551	558	726	842	923	965	987	1,182	1,510	1,317

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-7

## DC-9: Operating and Cost Statistics

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
<u>Scheduled Services</u> (Millions)														
Revenue Miles	110	288	319	321	330	334	306	303	325	333	350	361	390	388
Revenue Passenger Miles	4,812	12,389	13,937	14,377	15,995	16,014	15,953	15,052	16,776	17,524	20,537	22,044	21,860	22,220
Available Seat Miles	9,166	24,381	27,295	27,731	28,763	29,494	27,338	27,138	29,560	30,816	33,052	34,908	37,848	38,952
Passenger Load Factor (%)	52%	51%	51%	52%	56%	54%	58%	55%	57%	57%	62%	63%	58%	57%
Revenue Ton Miles	513	1,338	1,542	1,607	1,787	1,791	1,761	1,650	1,837	1,914	2,219	2,160	2,333	2,354
Available Ton Miles	1,145	3,127	3,480	3,529	3,661	3,754	3,467	3,457	3,750	3,907	4,179	4,384	4,697	4,920
Cargo Load Factor (%)	45%	43%	44%	46%	49%	48%	51%	48%	53%	49%	53%	54%	50%	48%
<u>All Services</u> (Millions)														
Revenue Miles	111	290	317	325	334	338	310	308	333	334	361	368	395	393
Revenue Passenger Miles	4,812	12,389	13,937	14,504	16,196	16,240	16,163	15,313	17,282	18,218	21,288	22,554	22,243	22,640
Available Seat Miles	9,220	24,518	27,295	28,021	29,106	29,862	27,705	27,583	30,319	31,883	34,016	35,603	38,400	40,423
Passenger Load Factor (%)	52%	51%	51%	52%	56%	55%	58%	56%	57%	57%	63%	63%	58%	56%
Revenue Ton Miles	513	1,338	1,542	1,620	1,807	1,813	1,782	1,676	1,888	1,983	2,295	2,381	2,371	2,396
Available Ton Miles	1,151	3,212	3,480	3,565	3,705	3,801	3,514	3,513	3,845	4,040	4,319	4,469	4,765	4,993
Cargo Load Factor (%)	45%	42%	44%	45%	49%	48%	51%	48%	49%	49%	53%	53%	50%	48%
Block Hours (Thousands)	391	998	1,076	1,082	1,111	1,126	1,044	1,029	1,106	1,147	1,211	1,228	1,242	1,257

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-7 (continued)

## DC-9: Operating and Cost Statistics

	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
<u>Operating Expenses</u> (Dollars Per Block Hour)														
Pilots and Copilots	128	82	90	99	103	111	127	141	149	163	178	194	220	202
Other Flight Personnel	-	-	-	21	-	-	-	-	-	-	-	-	-	-
Aircraft Fuels and Oils	156	100	110	109	110	116	197	251	283	329	351	493	766	712
Total Flying Operations	413	269	287	305	310	334	441	511	553	626	638	804	1,110	1,033
Total Direct Maintenance	103	69	76	80	80	86	103	114	113	114	119	130	155	139
Total Aircraft Operating Expense	697	440	470	497	504	529	673	765	807	886	923	1,104	1,465	1,362

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-8

## B-707: Operating and Cost Statistics

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
<u>Scheduled Services</u> (Millions)														
Revenue Miles	287	598	545	473	432	406	375	334	294	265	241	228	150	60
Revenue Passenger Miles	17,057	34,504	30,366	26,457	26,772	24,927	23,664	21,201	20,034	19,143	20,272	21,060	12,758	5,395
Available Seat Miles	33,802	71,389	63,309	54,357	49,273	46,369	43,872	39,904	35,474	33,317	32,671	32,358	21,078	8,556
Passenger Load Factor (%)	50%	48%	48%	49%	54%	54%	54%	53%	56%	57%	62%	65%	61%	63%
Revenue Ton Miles	2,883	5,752	5,162	4,450	4,375	4,148	4,027	3,343	3,080	2,714	2,653	2,527	1,558	646
Available Ton Miles	6,331	13,133	12,049	10,300	9,481	9,017	8,444	7,276	6,209	5,502	4,966	4,648	3,087	1,250
Cargo Load Factor (%)	46%	44%	43%	43%	46%	46%	48%	46%	50%	49%	53%	54%	50%	52%
<u>All Services</u> (Millions)														
Revenue Miles	340	695	614	543	497	465	424	373	340	307	269	245	158	61
Revenue Passenger Miles	17,057	34,504	30,366	33,990	33,717	32,777	30,525	26,689	26,626	25,251	24,175	23,823	14,005	5,498
Available Seat Miles	39,728	82,618	73,166	62,544	56,936	54,964	51,319	46,082	42,913	40,198	36,141	35,475	22,503	8,681
Passenger Load Factor (%)	43%	42%	42%	54%	59%	60%	59%	58%	62%	63%	67%	67%	62%	63%
Revenue Ton Miles	2,883	5,752	5,162	5,594	5,472	5,124	4,854	4,001	3,831	3,393	3,091	2,818	1,687	659
Available Ton Miles	7,606	15,444	13,405	11,882	11,087	10,337	9,525	8,198	7,261	6,465	5,607	5,036	3,265	1,269
Cargo Load Factor (%)	38%	37%	39%	47%	49%	46%	51%	49%	53%	52%	55%	56%	52%	52%
Block Hours (Thousands)	791	1,616	1,424	1,260	1,166	1,112	1,021	905	823	748	658	595	393	156

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-8 (continued)

## B-707: Operating and Cost Statistics

	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
<u>Operating Expenses</u> (Dollars Per Block Hour)														
Pilots and Copilots	165	105	121	130	134	156	158	174	197	213	224	251	312	292
Other Flight Personnel	52	29	34	37	40	46	51	63	65	72	77	82	106	110
Aircraft Fuels and Oils	380	199	208	209	215	242	487	540	553	630	694	1,002	1,471	1,423
Total Flying Operations	761	419	470	483	500	589	828	925	975	1,101	1,166	1,517	2,119	2,070
Total Direct Maintenance	193	101	108	91	104	130	134	146	157	171	195	215	225	164
Total Aircraft Operating Expense	1,253	736	831	828	858	922	1,246	1,388	1,458	1,626	1,766	2,177	2,843	2,642

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-9

## DC-8: Operating and Cost Statistics

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
<b>Scheduled Services</b> (Millions)														
Revenue Miles	107	208	196	170	159	145	87	81	74	68	54	46	18	13
Revenue Passenger Miles	6,631	11,837	10,808	9,460	9,403	8,421	5,310	4,865	4,498	3,833	2,871	2,586	185	19
Available Seat Miles	13,056	25,029	23,384	20,292	18,920	15,701	8,718	8,291	7,549	6,474	4,697	4,019	286	30
Passenger Load Factor (%)	51%	47%	46%	47%	50%	54%	61%	59%	60%	59%	61%	64%	55%	60%
Revenue Ton Miles	939	1,711	1,557	1,357	1,387	1,430	1,019	878	817	797	714	614	332	259
Available Ton Miles	1,988	3,971	3,723	3,217	2,979	2,831	1,838	1,676	1,510	1,404	1,246	1,074	630	483
Cargo Load Factor (%)	47%	43%	42%	42%	47%	51%	55%	52%	54%	57%	57%	57%	53%	54%
<b>All Services</b> (Millions)														
Revenue Miles	117	216	198	180	165	153	97	88	81	76	63	52	18	13
Revenue Passenger Miles	6,631	11,837	10,808	9,761	9,910	9,206	6,281	5,550	5,259	4,620	3,665	2,997	176	22
Available Seat Miles	13,668	25,340	23,660	20,758	19,012	16,757	10,017	9,228	8,559	7,491	5,624	4,497	267	47
Passenger Load Factor (%)	49%	47%	46%	47%	52%	55%	63%	60%	61%	62%	65%	67%	66%	47%
Revenue Ton Miles	939	1,711	1,557	1,474	1,466	1,526	1,136	953	905	897	842	698	344	264
Available Ton Miles	2,257	4,198	3,766	3,430	3,114	2,990	2,039	1,800	1,645	1,570	1,437	1,199	654	492
Cargo Load Factor (%)	42%	41%	41%	43%	47%	51%	56%	53%	55%	57%	56%	58%	51%	54%
Block Hours (Thousands)	276	515	471	435	408	382	244	220	203	189	156	126	45	31

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-9 (continued)

## DC-8: Operating and Cost Statistics

	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
<u>Operating Expenses</u> (Dollars Per Block Hour)														
Pilots and Copilots	179	92	108	115	124	131	175	202	195	203	226	274	384	341
Other Flight Personnel	51	23	25	29	30	30	44	48	51	59	71	54	115	99
Aircraft Fuels and Oils	415	213	216	227	233	242	506	646	655	740	785	1,134	2,497	2,160
Total Flying Operations	799	404	422	450	474	490	866	1,045	1,040	1,166	1,241	1,690	3,385	2,978
Total Direct Maintenance	259	118	126	107	118	128	180	201	194	189	234	296	435	311
Total Aircraft Operating Expense	1,453	765	810	815	846	890	1,334	1,506	1,464	1,634	1,762	2,328	4,177	3,614

I. P. Sharp Associates, CAB Form 41.

TABLE III-K-10

## Boeing 747: Percentage of Total Aircraft Operating Expense

<u>Year</u>	<u>Pilots &amp; Copilots</u>	<u>Other Flight Personnel</u>	<u>Aircraft Fuels &amp; Oils</u>	<u>Total Flying Operations</u>	<u>Total Direct Maintenance</u>
1970	9.3	3.2	19.5	61.6	12.6
1971	9.1	2.7	20.1	56.3	17.1
1972	7.9	2.2	20.9	44.5	14.6
1973	9.8	2.5	24.3	54.5	16.5
1974	7.9	2.2	38.1	64.2	12.6
1975	7.9	2.4	39.3	65.5	12.9
1976	8.7	2.3	40.1	67.3	13.9
1977	8.8	2.5	42.0	65.8	13.6
1978	8.6	2.8	41.8	62.1	13.1
1979	7.9	2.4	51.1	69.6	10.9
1980	6.9	2.0	59.4	74.6	8.9
1981	6.6	2.0	60.3	75.5	8.2

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-11

## McDonnell Douglas DC-10: Percentage of Total Aircraft Operating Expense

<u>Year</u>	<u>Pilots &amp; Copilots</u>	<u>Other Flight Personnel</u>	<u>Aircraft Fuels &amp; Oils</u>	<u>Total Flying Operations</u>	<u>Total Direct Maintenance</u>
1971	9.6	3.1	18.0	59.8	10.2
1972	11.4	3.4	21.1	53.9	12.3
1973	8.2	1.8	14.7	37.5	10.5
1974	10.3	1.9	29.0	56.4	16.7
1975	10.4	1.9	33.3	57.4	16.6
1976	10.5	2.0	35.1	58.3	16.1
1977	7.1	1.5	38.0	59.0	11.6
1978	10.8	2.3	38.5	60.1	15.7
1979	10.4	2.1	43.1	63.0	13.8
1980	8.8	1.9	52.3	69.8	11.8
1981	8.6	2.0	55.3	73.1	9.6

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-12

Lockheed L-1011: Percentage of Total Aircraft Operating Expense

<u>Year</u>	<u>Pilots &amp; Copilots</u>	<u>Other Flight Personnel</u>	<u>Aircraft Fuels &amp; Oils</u>	<u>Total Flying Operations</u>	<u>Total Direct Maintenance</u>
1972	10.0	3.0	16.7	50.5	15.2
1973	10.0	3.3	18.5	54.5	13.2
1974	8.9	2.3	28.6	57.3	15.9
1975	9.2	2.0	32.1	58.1	14.4
1976	9.1	1.9	32.5	56.7	14.6
1977	9.3	2.0	34.2	58.4	14.2
1978	9.7	2.0	35.5	55.7	14.4
1979	9.1	1.8	44.5	63.0	12.5
1980	8.6	1.7	52.0	68.6	10.9
1981	8.8	1.6	53.6	69.9	9.8

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-13

## Airbus A-300: Percentage of Total Aircraft Operating Expense

<u>Year</u>	<u>Pilots &amp; Copilots</u>	<u>Other Flight Personnel</u>	<u>Aircraft Fuels &amp; Oils</u>	<u>Total Flying Operations</u>	<u>Total Direct Maintenance</u>
1977	19.3	7.5	48.0	88.4	6.4
1978	13.8	4.7	41.0	68.1	9.2
1979	11.5	3.6	44.8	67.7	10.5
1980	10.5	3.3	51.9	72.4	8.3
1981	10.4	3.2	55.4	75.5	7.8

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-14

## Boeing 727: Percentage of Total Aircraft Operating Expense

<u>Year</u>	<u>Pilots &amp; Copilots</u>	<u>Other Flight Personnel</u>	<u>Aircraft Fuels &amp; Oils</u>	<u>Total Flying Operations</u>	<u>Total Direct Maintenance</u>
1968	14.6	3.4	24.5	57.7	17.5
1969	14.9	3.7	24.7	59.2	15.7
1970	15.0	3.9	23.0	58.4	15.2
1971	15.9	4.1	23.4	60.2	14.1
1972	16.2	4.3	23.1	60.0	14.4
1973	17.1	3.8	23.8	60.7	13.9
1974	15.3	3.6	32.1	64.5	12.1
1975	15.2	3.5	36.4	67.9	11.3
1976	15.3	3.3	37.4	69.0	11.3
1977	15.2	3.1	39.4	71.2	10.5
1978	15.4	2.9	41.4	70.2	10.0
1979	14.3	2.0	49.4	75.1	8.4
1980	12.9	1.9	55.0	75.9	6.3
1981	13.9	1.9	56.0	80.3	6.3

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-15

## Boeing 737: Percentage of Total Aircraft Operating Expense

<u>Year</u>	<u>Pilots &amp; Copilots</u>	<u>Other Flight Personnel</u>	<u>Aircraft Fuels &amp; Oils</u>	<u>Total Flying Operations</u>	<u>Total Direct Maintenance</u>
1968	19.8	NM	20.5	52.3	16.9
1969	19.0	0.1	21.8	53.4	16.6
1970	19.3	2.5	20.4	55.6	16.3
1971	20.0	3.4	20.2	57.7	15.1
1972	20.5	3.4	20.5	59.2	14.3
1973	20.8	3.2	21.0	60.0	14.5
1974	18.5	3.0	27.1	62.1	15.2
1975	18.2	2.7	30.4	64.3	14.6
1976	17.2	2.3	30.1	62.9	16.0
1977	17.3	2.1	32.5	66.3	14.8
1978	18.4	1.5	34.1	68.3	13.9
1979	16.2	0.8	40.6	69.8	12.9
1980	13.4	0.7	48.9	73.3	11.8
1981	12.5	0.8	52.0	75.5	9.9

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-16

## McDonnell Douglas DC-9: Percentage of Total Aircraft Operating Expense

<u>Year</u>	<u>Pilots &amp; Copilots</u>	<u>Other Flight Personnel</u>	<u>Aircraft Fuels &amp; Oils</u>	<u>Total Flying Operations</u>	<u>Total Direct Maintenance</u>
1968	18.4	NM	22.4	59.3	14.8
1969	18.6	NM	22.7	61.1	15.7
1970	19.1	NM	23.4	61.1	16.2
1971	19.9	4.2	21.9	61.4	16.1
1972	20.4	NM	21.8	61.5	15.9
1973	21.0	NM	21.9	63.1	16.3
1974	18.9	NM	29.3	65.5	15.3
1975	18.4	NM	32.8	66.8	14.9
1976	18.5	NM	35.1	68.5	14.0
1977	18.4	NM	37.1	70.7	12.9
1978	19.3	NM	38.0	69.1	12.9
1979	17.6	NM	44.7	72.8	11.8
1980	15.0	NM	52.3	75.8	10.6
1981	14.8	NM	52.3	75.8	10.2

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-17

## Boeing 707: . Percentage of Total Aircraft Operating Expense

<u>Year</u>	<u>Pilots &amp; Copilots</u>	<u>Other Flight Personnel</u>	<u>Aircraft Fuels &amp; Oils</u>	<u>Total Flying Operations</u>	<u>Total Direct Maintenance</u>
1968	14.8	4.2	30.3	60.7	15.9
1969	14.3	3.9	27.0	56.9	13.7
1970	14.5	4.1	25.0	56.6	13.0
1971	15.7	4.5	25.2	58.3	11.0
1972	15.6	4.7	25.1	58.3	12.1
1973	16.9	5.0	26.2	63.9	14.1
1974	12.7	4.1	39.1	66.5	10.8
1975	12.5	4.5	38.9	66.6	10.5
1976	13.5	4.5	37.9	66.9	10.8
1977	13.1	4.4	38.7	67.7	10.5
1978	12.7	4.4	39.3	66.0	11.0
1979	11.5	3.8	46.0	69.7	9.9
1980	11.0	3.7	51.7	74.5	7.9
1981	11.1	4.2	53.9	78.3	6.2

Source: I.P. Sharp Associates, CAB Form 41.

TABLE III-K-18

McDonnell Douglas DC-8: Percentage of Total Aircraft Operating Expense

<u>Year</u>	<u>Pilots &amp; Copilots</u>	<u>Other Flight Personnel</u>	<u>Aircraft Fuels &amp; Oils</u>	<u>Total Flying Operations</u>	<u>Total Direct Maintenance</u>
1968	12.3	3.5	28.6	55.0	17.8
1969	12.0	3.0	27.8	52.8	15.4
1970	13.3	3.1	26.7	52.1	15.6
1971	14.1	3.6	27.9	55.2	13.1
1972	14.7	3.5	27.5	56.0	13.9
1973	14.7	3.4	27.2	55.1	14.4
1974	13.1	3.3	37.9	64.9	13.5
1975	13.4	3.2	42.9	69.4	13.3
1976	13.3	3.5	44.7	71.0	13.3
1977	12.4	3.6	45.3	71.4	11.6
1978	12.8	4.0	44.6	70.4	13.3
1979	11.8	2.3	48.7	72.6	12.7
1980	9.2	2.8	59.8	81.0	10.4
1981	9.4	2.7	59.8	82.4	8.6

Source: I.P. Sharp Associates, CAB Form 41.

APPENDIX III-L

APPENDIX III-L

Table III-L-1 below shows the competition in the top 25 U.S. domestic city pairs for 1980 and comparisons with 1979. The number of competitors and the number of effective competitors are both shown in the table for the two years, with abbreviations for the airlines (effective competitors in 1980) also shown. There is no consistent pattern of increases or decreases in the total number of competitors in each of the city pairs. However, it is fair to say that in most cases a change did occur. In terms of effective competitors, the table reveals that the number of effective competitors in 1980 decreased from 1979. In fact, of the 25 city pairs surveyed here, seven markets showed an increase in the number of effective competitors in 1980 over 1979, one market showed a decrease, and eleven markets showed no change. There are five markets for which we did not have sufficient information to allow comparison.

TABLE III-L-1

Competition in the Top Twenty-Five U.S.  
Domestic City-Pairs  
(Twelve Months Ending 30 September 1979)

1980 Rank	1980 City Pairs	Number of Competitors				1980 Airlines
		1980 Total	1979 Total	1980 Effective	1979 Effective	
1	NYC/Newark-Wash., D.C.	7	10	1	3	EA
2	Los Angeles-NYC	6	6	3	3	AA, TW, UA
3	Boston-NYC	6	5	1	2	EA
4	Miami-NYC	7	6	2	3	EA, PA
5	Los Angeles-San Francisco	9	8	3	4	PS, UA, WA
6	Chicago-NYC	6	6	3	3	AA, TW, UA
7	Ft. Lauderdale-NYC	6	3	2	3	DL, EA
8	NYC/Newark-San Francisco	5	6	3	3	AA, TW, UA
9	Dallas/Ft. Worth-Houston	2	N/A	2	N/A	TN, BI
10	Chicago-Los Angeles	4	4	4	4	AA, CO, TW, UA
11	Honolulu-Lihue	2	2	2	2	HA, TS
12	Las Vegas-Los Angeles	4	4	2	1	PS, WA
13	Atlanta-New York	4	3	2	2	DL, EA
14	NYC/Newark-Orlando	5	3	3	3	DL, EA, PA
15	Detroit & Ann Arbor-NYC	6	5	2	2	AA, NW
16	Boston-Wash., D.C.	6	6	3	3	DL, EA, AA
17	Honolulu-Kahului	2	2	2	2	HA, TS
18	NYC/Newark-Tampa	5	3	3	2	DL, EA, PA
19	NYC/Newark-Pittsburgh	4	4	2	3	AL, TW
20	Los Angeles- Seattle/Tacoma	5	6	2	3	UA, WA
21	Chicago-Minneapolis	5	5	3	3	UA, RC, NW
22	NYC/Newark-W. Palm Beach	6	N/A	2	N/A	EA, PA
23	Houston-NYC	6	N/A	4	N/A	CO, DL, EA, PA
24	Chicago-San Francisco	3	N/A	3	N/A	AA, TW, UA
25	Houston-New Orleans	7	N/A	2	N/A	TI, WN

Source: Nawal K. Teneja, The Commercial Airline Industry: Managerial Practices and Regulatory Policies, Lexington, Mass: Lexington Books, 1976.

APPENDIX IV

FINANCIAL PERFORMANCE OF THE AIRLINES

AD-A131 878

DEVELOP A NORMATIVE OR DESCRIPTIVE MODEL OF THE  
INTERNATIONAL/DOMESTIC CIVIL AVIATION INDUSTRY VOLUME 3  
(U) SYNERGY INC WASHINGTON DC L H DYMOND ET AL.

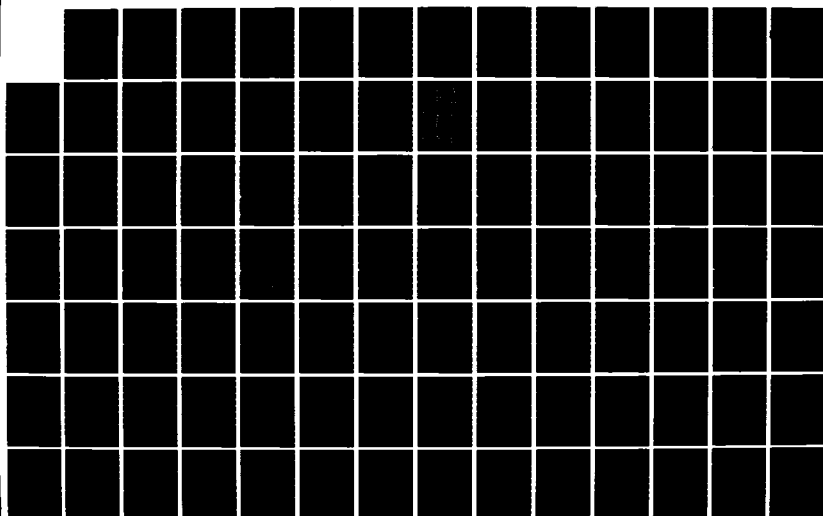
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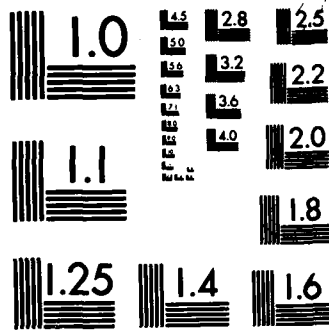
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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

APPENDIX IV-A

Financial Statement Data  
1968-1981

#### APPENDIX IV-A

Table 13 in the text provides system-trunk and local-service carrier cost indices broken out by the major cost components over the period 1970-1981. These indexes allow the reader to judge the relative increase in costs within a particular cost component and for overall costs as designated in the composite index over that time period. Table 13, however, does not provide any information about the relative mix of the various cost components, and how that mix has changed over time to affect total costs. Table B-1 below presents the component weights for airline costs that correspond to the cost index presented in Table 13 in the text as produced by the Air Transport Association. The figures in Table B-1 show the percent of total cash operating expenses accounted for by each of the cost categories for each year from 1970 to 1981.

In comparing row-by-row entries across time in Table B-1, it is evident that the component weights for the individual cost categories declined from 1970 through 1981 for every cost category except fuel and traffic commissions. Fuel showed a rather significant increase over the twelve-year period rising from 12.7 percent of total cash operating expenses in 1970 to over 30 percent in 1981. Traffic commissions showed somewhat less of an increase, rising from 2.9 percent in 1970 to a high of 6.4 percent in 1981. All the other cost categories showed relative declines over the period. Labor declined from 46.3 percent steadily down to 35.5 percent in 1981. Aircraft maintenance material costs also showed a steady decline from 3.3 percent down to 1.8 percent in 1981. Advertising and promotion, passenger meals, interest charges, and landing fees also showed relative declines over the period.

As a point of reference, total cash operating expenses in 1980 for system trunks and local-service carriers was slightly in excess of \$30 billion.

Table B-1

Component Weights for  
Airline Costs in ATA  
Cost Index: Percent of Total  
Cost Operating Expenses  
1970-1981<sup>1</sup>

<u>Cost Categories</u>	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
1. Labor	46.3	46.3	47.0	46.5	42.1	41.4	41.8	42.1	42.4	39.7	36.1	35.5
2. Fuel	12.7	12.6	12.0	12.2	17.4	19.1	19.5	20.5	20.1	25.1	30.5	30.1
3. Landing Fees	2.2	2.6	2.6	2.7	2.4	2.4	2.6	2.5	2.2	2.0	1.7	1.6
4. Interest	4.3	4.1	3.5	3.6	3.4	2.9	2.4	2.1	2.7	2.5	2.9	3.3
5. Aircraft Maintenance Material	3.3	2.9	3.2	3.2	3.0	2.9	2.9	2.9	2.6	2.3	2.1	1.8
6. Traffic Commissions	2.9	3.1	3.5	3.7	3.7	3.9	4.6	4.6	4.9	5.1	5.5	6.4
7. Passenger Meal	4.0	3.8	4.1	4.1	3.6	3.5	3.5	3.5	3.5	3.4	3.0	3.0
8. Advertising and Promotion	2.7	2.6	2.6	2.4	2.0	1.9	1.8	1.8	1.7	1.6	1.6	1.9
9. Other	21.6	22.1	21.5	21.6	22.4	22.1	21.0	20.0	19.9	18.3	16.6	16.4

Source: Air Transport Association

<sup>1</sup>1981 figure represents 3rd Quarter, 1981.

Selected Income Statement Items  
Industry Total  
(\$ Millions)

	1969	1970	1971	1972	1973	1974	1975	1976	1977
INDUSTRY TOTAL									
REVENUE	777.84	930.54	1004.58	1113.71	1273.29	1513.06	1579.17	17919.91	20440.12
OPERATING EXPENSES	755.620	900.453	9717.102	1059.174	12152.047	14499.414	15635.156	17194.396	19516.414
PROFIT BEFORE TAXES	22.22	30.09	32.48	33.36	62.53	119.13	81.60	89.22	121.27
TAXES ON INCOME	-25.703	-34.650	-37.993	-34.640	-403.614	-450.913	-115.422	-382.400	-390.311
PROFIT AFTER TAXES	56.40	71.359	40.549	43.050	40.592	36.360	19.296	17.432	22.55
EXPENSES FOR DEPRECIATION	-12.11	-24.56	-277.72	-264.26	-271.72	-143.16	-277.78	-115.53	28.73
NET INCOME	33.29	46.799	51.252	370.281	362.079	503.331	72.762	601.392	957.529
DEPRECIATION EXPENSE	134.41	62.84	21.42	95.40	125.25	220.22	-15.53	169.47	217.29
FINANCIAL INCOME	1.00	-1.51	-3.55	-4.79	4.97	-0.34	-4.55	125.15	-0.38
TAXES FOR FINANCIAL INCOME	0.964		2.361	-2.365	-6.957	0.790	-7.969	-15.343	21.921
ADJUSTING CHARGE					396.47	5.58		1.05	-47.71
NET INCOME	201.910	27.150	17.288	214.716	207.614	344.888	-69.650	570.462	715.550

	1978	1979	1980	1981
INDUSTRY TOTAL				
REVENUE	23431.76	27769.45	33725.70	33449.82
OPERATING EXPENSES	2205.672	27500.105	33947.312	33557.919
PROFIT BEFORE TAXES	290.09	266.55	250.00	265.36
TAXES ON INCOME	-551.666	-707.842	-1000.617	-1129.553
PROFIT AFTER TAXES	-261.73	-34.53	-62.95	-95.07
EXPENSES FOR DEPRECIATION	43.230	93.492	112.473	148.230
FINANCIAL INCOME	75.00	-2.34	2.91	-320.73
TAXES FOR FINANCIAL INCOME	145.249	182.251	-219.720	-428.644
ADJUSTING CHARGE	242.35	-193.02	-94.95	-127.16
NET INCOME	9.85	-4.24	16.272	248.519
EXPENSES FOR DEPRECIATION	-7.905	1.944	134.94	57.50
TAXES FOR DEPRECIATION	17.16	19.14	-10.043	-0.030
ADJUSTING CHARGE	12-0.271	341.154	-6.20	0.17
NET INCOME			17.190	4.302

Source: I.P. Sharp, CAB Form 41.

Selected Income Statement Items  
Nations  
(Millions)

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
NET INCOME	404.33	408.20	614.78	693.19	891.50	1152.51	1255.24	1433.59	1757.12	2136.49
NET OPERATING REVENUES	-114.823	408.593	579.518	674.537	832.630	1095.313	1202.565	1354.084	1644.402	1998.219
EXPENSES	1.22	1.90	2.06	3.29	3.32	6.59	8.32	5.74	11.46	19.76
EXPENSE ON LONG-TERM DEBT AT	-24.325	-32.245	-29.053	-22.665	-21.257	-24.201	-26.393	-25.977	-30.059	-34.525
NET INTEREST EXPENSES	2.772	1.081	0.363	-0.352	0.022	0.246	0.548	0.292	-3.07	-5.28
OPERATING INCOME + EXPENSE	-20.70	-35.33	-37.10	-24.76	-16.64	-2.61	-3.25	12.49	1.77	-5.71
EXPENSES FROM TAXES	-36.146	-35.768	-24.679	9.399	47.215	71.544	49.466	91.329	114.431	137.557
EXPENSES FROM TAXES	-12.21	-3.85	5.15	9.76	14.23	17.15	15.04	24.42	34.61	39.63
EXPENSES FROM TAXES	-0.46	0.01	-1.59	-0.47	0.47	-1.47	0.47	-0.21	0.70	0.95
EXPENSES FROM TAXES	0.066					0.174	0.790	-0.222		
EXPENSES FROM TAXES	-24.398	-34.967	-31.413	0.183	33.533	59.425	62.190	67.720	42.031	91.890

	1979	1980	1981
NET INCOME	3085.50	4130.01	4925.24
NET OPERATING REVENUES	2964.669	4034.483	4609.442
EXPENSES	29.56	35.94	54.25
EXPENSE ON LONG-TERM DEBT AT	-130.152	-197.834	-243.924
NET INTEREST EXPENSES	-8.09	-13.60	-22.04
OPERATING INCOME + EXPENSE	16.740	26.304	36.128
EXPENSES FROM TAXES	24.52	-52.26	-3.14
EXPENSES FROM TAXES	145.350	89.261	221.651
EXPENSES FROM TAXES	3.37	1.57	60.46
EXPENSES FROM TAXES	-0.006	0.04	2.44
EXPENSES FROM TAXES	141.973	87.527	152.904

Source: I.P. Sharp, CAB Form 41.

Selected Income Statement Items  
Nationals  
(\$Millions)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1978
47. NATIONALS											
TOTAL OPERATING REVENUES	424.33	492.20	569.59	519.79	603.00	891.60	1152.51	1255.29	1423.69	1757.12	2136.49
TOTAL OPERATING EXPENSES	410.923	439.593	557.275	579.619	629.637	817.680	1025.333	1202.559	1354.024	1644.407	1988.219
INTEREST INCOME	1.22	1.90	2.39	2.06	2.29	3.92	6.59	4.32	5.74	11.96	19.76
INTEREST ON LONG-TERM DEBT AT	-24.325	-32.245	-33.053	-29.050	-22.905	-21.257	-24.201	-25.399	-25.977	-30.059	-64.675
OTHER INTEREST EXPENSES	2.772	1.041	0.353	-0.352	0.032	0.208	0.246	0.549	0.777	-3.07	-5.28
CAPITALIZED INTEREST	-22.70	-35.33	-37.13	-26.76	-16.64	-2.61	15.46	-3.25	17.99	0.852	7.865
PROFIT BEFORE INCOME TAXES	-25.196	-31.768	-24.579	9.399	47.815	55.313	71.544	49.466	91.320	114.431	137.557
INCOME TAXES CURRENT PERIOD	-12.21	-2.85	5.15	9.76	14.23	17.15	8.79	15.94	24.92	34.61	39.63
PROVISION FOR DEFERRED TAXES	-0.48	0.01	-1.54	-0.67	0.47	0.50	-1.47	0.47	-0.21	-0.22	-0.95
INCOME TAXES FOR EXTRAORDINARY	0.056					-0.174	0.790		-0.222		
ACCOUNTING CHARGES						417.89			1.50		
NET INCOME	-24.338	-34.967	-31.411	0.168	33.998	59.425	62.190	33.937	67.720	82.031	91.890

	1979	1980	1981
47. NATIONALS			
TOTAL OPERATING REVENUES	3015.50	3130.01	4025.24
TOTAL OPERATING EXPENSES	2964.563	3039.883	4500.882
INTEREST INCOME	23.55	35.94	54.25
INTEREST ON LONG-TERM DEBT AT	-130.152	-197.934	-293.927
OTHER INTEREST EXPENSES	-9.09	-13.60	-22.04
CAPITALIZED INTEREST	15.740	25.304	35.129
PROFIT BEFORE INCOME TAXES	24.52	-52.26	-3.14
INCOME TAXES CURRENT PERIOD	145.359	87.261	221.651
PROVISION FOR DEFERRED TAXES	3.17	1.57	60.46
EXTRAORDINARY ITEMS	-0.005		
INCOME TAXES FOR EXTRAORDINARY		0.04	2.44
ACCOUNTING CHARGES			
NET INCOME	141.973	87.527	152.904

Source: I.P. Sharp, CAB Form 41.

Selected Income Statement Items  
Regionals  
(\$ millions)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
REG REGIONALS												
TOTAL OPERATING REVENUES	7.90	7.82	7.83	8.11	10.91	15.23	19.87	33.97	40.86	90.99	139.05	226.60
TOTAL OPERATING EXPENSES	5.254	5.996	7.477	7.076	9.720	15.259	19.802	35.110	41.504	77.429	104.790	222.553
INTEREST INCOME	0.02	0.01	0.05	0.03	0.02	0.05	0.05	0.08	0.04	0.07	0.19	0.53
INTEREST ON LONG-TERM DEBT AT	-0.091	-0.071	-0.075	-0.079	-0.188	-0.220	-0.225	-0.359	-0.923	-1.579	-3.048	-17.314
OTHER INTEREST EXPENSES												
CAPITALIZED INTEREST												
PROCEEDS FROM SALE OF INTEREST	-0.01	0.08	0.02	0.15	-0.26	-0.001			0.018	-0.17	-0.13	-0.54
INCOME BEFORE INCOME TAXES	0.229	0.604	-0.020	1.190	0.934	0.05		-0.58	-0.84	2.55	8.26	-2.52
INCOME TAXES CURRENT PERIOD	0.48	0.10	0.08	0.46	0.33	0.04	0.01	-1.919	-0.948	5.608	6.553	0.790
ACCELERATED OPERATIONS								0.07	0.94	2.03	3.45	3.53
EXTRAORDINARY ITEMS				0.01								
INCOME TAXES FOR EXTRAORDINARY						-0.59		0.28	-0.07			
ACCOUNTING CHANGES										-0.145	-0.005	
NET INCOME	0.447	0.300	-0.102	0.743	0.599	0.77	5.53	-1.612	0.46	-1.41	2.702	0.92
						1.057	5.333		-1.249	2.338		-2.520

	1980	1981
REG REGIONALS		
TOTAL OPERATING REVENUES	425.53	641.19
TOTAL OPERATING EXPENSES	435.103	644.323
INTEREST INCOME	1.36	4.90
INTEREST ON LONG-TERM DEBT AT	-30.751	-44.257
OTHER INTEREST EXPENSES	-1.25	-1.46
CAPITALIZED INTEREST	1.950	1.771
PROCEEDS FROM SALE OF INTEREST	-13.31	-15.12
INCOME BEFORE INCOME TAXES	-23.798	-21.122
INCOME TAXES CURRENT PERIOD	-0.10	7.52
ACCELERATED OPERATIONS		
EXTRAORDINARY ITEMS		
INCOME TAXES FOR EXTRAORDINARY	1.90	3.16
ACCOUNTING CHANGES		-0.030
NET INCOME	-21.901	-25.271

Source: I.P. Sharp, CAB Form 41.

**Selected Income Statement Items**  
**Cr:50**  
**(\$ Millions)**

	1969	1969	1970	1971	1972	1974	1975	1976	1977	1978	1979
220 SYSTEMS ALL OTHERS											
NET OPERATING REVENUES	137.26	244.60	245.35	263.91	287.25	333.33	337.45	337.97	461.87	616.40	639.68
NET OPERATING EXPENSES	202.34	237.16	224.40	223.78	259.35	329.63	372.40	375.67	429.62	570.34	707.66
INCOME TAXES	0.41	1.27	1.44	1.54	1.32	2.15	2.16	3.57	4.45	7.60	5.55
INCOME BEFORE TAXES	-65.09	-93.03	-80.49	-61.41	-73.42	-98.45	-137.11	-141.27	-172.20	-261.24	-373.53
DEFERRED TAXES	-	-	-	-	-	-	-	-	-	-	-
INCOME AFTER TAXES	-65.09	-93.03	-80.49	-61.41	-73.42	-98.45	-137.11	-141.27	-172.20	-261.24	-373.53
NET OPERATING REVENUES	137.26	244.60	245.35	263.91	287.25	333.33	337.45	337.97	461.87	616.40	639.68
NET OPERATING EXPENSES	202.34	237.16	224.40	223.78	259.35	329.63	372.40	375.67	429.62	570.34	707.66
INCOME TAXES	0.41	1.27	1.44	1.54	1.32	2.15	2.16	3.57	4.45	7.60	5.55
INCOME BEFORE TAXES	-65.09	-93.03	-80.49	-61.41	-73.42	-98.45	-137.11	-141.27	-172.20	-261.24	-373.53
DEFERRED TAXES	-	-	-	-	-	-	-	-	-	-	-
INCOME AFTER TAXES	-65.09	-93.03	-80.49	-61.41	-73.42	-98.45	-137.11	-141.27	-172.20	-261.24	-373.53
NET OPERATING REVENUES	137.26	244.60	245.35	263.91	287.25	333.33	337.45	337.97	461.87	616.40	639.68
NET OPERATING EXPENSES	202.34	237.16	224.40	223.78	259.35	329.63	372.40	375.67	429.62	570.34	707.66
INCOME TAXES	0.41	1.27	1.44	1.54	1.32	2.15	2.16	3.57	4.45	7.60	5.55
INCOME BEFORE TAXES	-65.09	-93.03	-80.49	-61.41	-73.42	-98.45	-137.11	-141.27	-172.20	-261.24	-373.53
DEFERRED TAXES	-	-	-	-	-	-	-	-	-	-	-
INCOME AFTER TAXES	-65.09	-93.03	-80.49	-61.41	-73.42	-98.45	-137.11	-141.27	-172.20	-261.24	-373.53
NET OPERATING REVENUES	137.26	244.60	245.35	263.91	287.25	333.33	337.45	337.97	461.87	616.40	639.68
NET OPERATING EXPENSES	202.34	237.16	224.40	223.78	259.35	329.63	372.40	375.67	429.62	570.34	707.66
INCOME TAXES	0.41	1.27	1.44	1.54	1.32	2.15	2.16	3.57	4.45	7.60	5.55
INCOME BEFORE TAXES	-65.09	-93.03	-80.49	-61.41	-73.42	-98.45	-137.11	-141.27	-172.20	-261.24	-373.53
DEFERRED TAXES	-	-	-	-	-	-	-	-	-	-	-
INCOME AFTER TAXES	-65.09	-93.03	-80.49	-61.41	-73.42	-98.45	-137.11	-141.27	-172.20	-261.24	-373.53
NET OPERATING REVENUES	137.26	244.60	245.35	263.91	287.25	333.33	337.45	337.97	461.87	616.40	639.68
NET OPERATING EXPENSES	202.34	237.16	224.40	223.78	259.35	329.63	372.40	375.67	429.62	570.34	707.66
INCOME TAXES	0.41	1.27	1.44	1.54	1.32	2.15	2.16	3.57	4.45	7.60	5.55
INCOME BEFORE TAXES	-65.09	-93.03	-80.49	-61.41	-73.42	-98.45	-137.11	-141.27	-172.20	-261.24	-373.53
DEFERRED TAXES	-	-	-	-	-	-	-	-	-	-	-
INCOME AFTER TAXES	-65.09	-93.03	-80.49	-61.41	-73.42	-98.45	-137.11	-141.27	-172.20	-261.24	-373.53
NET OPERATING REVENUES	137.26	244.60	245.35	263.91	287.25	333.33	337.45	337.97	461.87	616.40	639.68
NET OPERATING EXPENSES	202.34	237.16	224.40	223.78	259.35	329.63	372.40	375.67	429.62	570.34	707.66
INCOME TAXES	0.41	1.27	1.44	1.54	1.32	2.15	2.16	3.57	4.45	7.60	5.55
INCOME BEFORE TAXES	-65.09	-93.03	-80.49	-61.41	-73.42	-98.45	-137.11	-141.27	-172.20	-261.24	-373.53
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DEFERRED TAXES	-	-	-	-	-	-	-	-	-	-	-
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DEFERRED TAXES	-	-	-	-	-	-	-	-	-	-	-
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DEFERRED TAXES	-	-	-	-	-	-	-	-	-	-	-
INCOME AFTER TAXES	-65.09	-93.03	-80.49	-61.41	-73.42	-98.45	-137.11	-141.27	-172.20	-261.24	-373.53
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DEFERRED TAXES	-	-	-	-	-	-	-	-	-	-	-
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NET OPERATING REVENUES	137.26	244.60	245.35	263.91	287.25	333.33	337.45	337.97	461.87	616.40	639.68
NET OPERATING EXPENSES	202.34	237.1									

	1920	1921
CORPORATION ALL CASES		
TOTAL OPERATING REVENUES	892.10	858.45
TOTAL OPERATING EXPENSES	926.023	890.439
INTEREST INCOME	7.14	8.51
INTEREST ON LONG-TERM DEBT AT	-54.761	-56.526
ONCE-PAID INTEREST EXPENSES	-2.15	-7.98
CAPITALIZED INTEREST	5.042	4.893
NON-EXERCISING INCOME & REFUSE	-2.77	10.98
INCOME BEFORE INCOME TAXES	-47.537	-25.063
INCOME TAXES CURRENT PERIOD	-19.23	-12.02
DISCONTINUED OPERATIONS		
EXTENDING BY ITEMS		
INCOME TAXES FOR EXTENDING		
ACTUALLY CHARGED		
FOR ITEMS	-21.455	-13.061
VALUE ADDED		

**Source: I.P. Sharp, CAB Form 41.**

Selected Balance Sheet Items  
Industry Total  
(\$ Millions)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
INDUSTRY TOTAL										
TOTAL CURRENT ASSETS	2534.01	2788.10	2844.99	3110.67	3265.23	3603.56	3837.98	4071.57	4674.86	5310.34
TOTAL INVESTMENTS AND SPECIAL	1597.269	1798.351	1460.309	1367.182	1463.887	1336.183	1235.911	1005.957	1082.245	792.251
TOTAL OPERATING PROPERTY AND	8162.48	8887.43	10033.96	9853.94	10187.47	10740.75	10079.08	10067.09	8835.98	1005.07
TOTAL NONOPERATING PROPERTY A	42.399	61.480	87.298	167.139	160.310	109.114	182.434	86.885	58.720	133.023
TOTAL OTHER ASSETS	262.39	268.22	344.46	384.17	376.82	417.01	351.15	318.34	334.52	287.40
TOTAL ASSETS	12598.546	13803.582	14790.836	14883.108	15453.592	16206.617	15688.561	15550.743	15937.438	17334.700
TOTAL CURRENT LIABILITIES	2033.64	2508.74	2663.95	2682.23	2919.94	3109.42	3510.90	3617.11	3662.87	4563.00
LONG-TERM DEBT	5086.059	6251.569	7117.129	6569.673	6518.115	6622.412	5731.401	5641.077	5120.121	4611.787
TOTAL NONCURRENT LIABILITIES	6011.95	6305.91	7436.72	6967.07	6920.77	6949.06	6032.55	5919.56	5304.08	5284.03
TOTAL DEFERRED CREDITS	933.435	1098.472	1180.447	1204.463	1217.784	1349.389	1481.900	1462.032	1533.109	1609.147
NET STOCKHOLDERS' EQUITY	3625.53	3801.95	3852.45	4222.41	4467.48	4606.12	4655.21	4951.14	5054.89	5227.65
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	12598.546	13803.582	14790.836	14883.108	15453.592	16206.617	15688.561	15550.743	15937.438	17334.700

	1978	1979	1980	1981
INDUSTRY TOTAL				
TOTAL CURRENT ASSETS	5692.32	6718.46	7536.15	4474.59
TOTAL INVESTMENTS AND SPECIAL	1013.578	1269.044	1107.463	465.105
TOTAL OPERATING PROPERTY AND	14227.22	17151.79	19567.48	14059.30
TOTAL NONOPERATING PROPERTY A	187.960	313.863	384.805	108.347
TOTAL OTHER ASSETS	232.48	284.30	304.72	165.38
TOTAL ASSETS	21405.558	25728.158	28900.611	19272.723
TOTAL CURRENT LIABILITIES	5417.51	7265.04	8760.40	5748.47
LONG-TERM DEBT	4418.194	5986.695	7107.096	4677.222
TOTAL NONCURRENT LIABILITIES	7285.06	9301.66	11191.93	7771.24
TOTAL DEFERRED CREDITS	1611.741	1493.587	1348.194	893.746
NET STOCKHOLDERS' EQUITY	7091.25	7662.39	7601.31	4859.26
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	21405.558	25728.158	28900.611	19272.723

Source: I.P. Sharp, CAB Form 41.

Selected Balance Items  
Majors  
(\$ Millions)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
<b>U.S. SYSTEM MAJORS</b>										
TOTAL CURRENT ASSETS	2,492.74	2219.11	2281.25	2484.02	2632.12	2915.97	3464.38	3649.29	4194.36	4780.88
TOTAL INVESTMENTS AND SPECIAL	1169.320	1394.049	1134.985	1122.390	1154.468	1028.313	983.560	750.984	790.112	618.167
TOTAL OPERATING PROPERTY AND	6416.19	7179.74	8128.80	8940.66	8582.47	9216.92	9299.58	9315.70	9900.52	9800.66
TOTAL NONOPERATING PROPERTY A	28.649	24.118	34.469	116.901	134.460	89.392	174.369	61.216	50.061	95.223
TOTAL OTHER ASSETS	173.17	181.52	280.19	316.69	326.64	371.55	323.37	297.51	290.93	295.41
TOTAL ASSETS	9997.063	10989.535	11905.689	12980.670	12830.167	13622.137	14245.264	14074.698	14325.986	15590.337
TOTAL CURRENT LIABILITIES	1538.78	1925.63	2080.57	2096.91	2383.90	2519.67	3182.74	3271.53	3570.88	4121.32
LONG-TERM DEBT	4691.923	4763.949	5512.334	5072.100	5203.602	5427.731	5239.367	5179.535	4607.966	4075.794
TOTAL NONCURRENT LIABILITIES	4711.54	5912.61	5796.23	5427.51	5530.06	5709.99	5482.75	5411.34	4837.03	4641.11
TOTAL DEFERRED CREDITS	810.663	954.870	1025.705	1069.394	1095.544	1208.002	1384.126	1355.980	1465.001	1538.812
NET STOCKHOLDERS' EQUITY	2936.09	3161.76	3068.53	3580.06	3820.67	3984.48	4195.65	4035.84	4453.07	5289.09
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	9997.063	10989.535	11905.689	12980.670	12830.167	13622.137	14245.264	14074.698	14325.986	15590.337

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	1978	1979	1980	1981
<b>U.S. SYSTEM MAJORS</b>				
TOTAL CURRENT ASSETS	5096.22	5799.45	6531.34	3625.51
TOTAL INVESTMENTS AND SPECIAL	736.252	1087.260	805.348	352.593
TOTAL OPERATING PROPERTY AND	12755.70	14427.37	16043.77	10960.20
TOTAL NONOPERATING PROPERTY A	90.931	166.376	216.642	39.759
TOTAL OTHER ASSETS	282.69	264.17	201.11	75.80
TOTAL ASSETS	18961.792	21744.623	23799.213	15053.861
TOTAL CURRENT LIABILITIES	4855.59	6331.28	7600.82	4794.89
LONG-TERM DEBT	3674.830	4640.604	5375.442	3398.406
TOTAL NONCURRENT LIABILITIES	6222.24	7454.54	8502.18	5939.11
TOTAL DEFERRED CREDITS	1521.808	1351.514	1184.587	741.512
NET STOCKHOLDERS' EQUITY	6362.15	6607.29	6411.62	3578.35
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	18961.792	21744.623	23799.213	15053.861

Source: I.P. Sharp, CAB Form 41.

Selected Balance Sheet Items  
Nationals  
(\$ Millions)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
<b>NAT NATIONALS</b>											
TOTAL CURRENT ASSETS	134.97	144.36	155.43	178.52	171.15	204.44	297.12	336.07	403.43	453.70	524.27
TOTAL INVESTMENTS AND SPECIAL	49.964	44.348	55.646	50.181	100.434	96.547	190.615	176.065	212.486	156.246	270.680
TOTAL OPERATING PROPERTY AND	462.21	491.58	431.33	391.42	373.95	372.58	631.09	637.87	700.18	835.42	1315.56
TOTAL NONOPERATING PROPERTY A	7.157	21.836	33.043	37.267	4.413	1.619	3.289	22.618	4.989	33.909	39.999
TOTAL OTHER ASSETS	32.57	36.44	31.97	22.10	16.42	14.41	19.72	16.16	39.73	-10.24	-3.97
TOTAL ASSETS	686.873	738.538	707.417	679.491	666.377	689.603	1141.843	1188.784	1311.068	1468.995	2146.545
TOTAL CURRENT LIABILITIES	139.51	154.24	170.51	171.17	150.47	176.01	253.42	269.33	319.81	366.86	488.77
LONG-TERM DEBT	398.012	446.305	387.731	346.798	281.418	252.724	403.064	395.264	418.949	430.511	667.222
TOTAL NONCURRENT LIABILITIES	400.46	449.08	417.03	392.21	320.43	291.69	452.62	422.19	434.53	476.47	924.15
TOTAL DEFERRED CREDITS	20.923	27.904	34.098	37.909	42.194	42.587	82.213	88.734	52.943	52.750	82.578
NET STOCKHOLDERS' EQUITY	128.12	107.34	97.05	132.30	156.17	181.05	353.59	408.48	503.74	572.91	651.05
TOTAL LIABILITIES AND STOCKHO	686.873	738.538	707.417	679.491	666.377	689.603	1141.843	1188.784	1311.068	1468.995	2146.545

	1979	1980	1981
<b>NAT NATIONALS</b>			
TOTAL CURRENT ASSETS	799.80	885.22	727.30
TOTAL INVESTMENTS AND SPECIAL	174.891	278.457	102.637
TOTAL OPERATING PROPERTY AND	2316.41	3138.69	2716.91
TOTAL NONOPERATING PROPERTY A	100.962	164.375	65.237
TOTAL OTHER ASSETS	11.56	81.52	76.07
TOTAL ASSETS	3403.624	4548.466	3688.153
TOTAL CURRENT LIABILITIES	769.84	1017.88	841.77
LONG-TERM DEBT	1142.764	1490.911	1061.936
TOTAL NONCURRENT LIABILITIES	1543.63	2260.21	1543.16
TOTAL DEFERRED CREDITS	134.691	145.313	129.287
NET STOCKHOLDERS' EQUITY	941.12	1125.07	1173.94
TOTAL LIABILITIES AND STOCKHO	3403.624	4548.466	3688.153

Source: I.P. Sharp, CAB Form 41.

Selected Balance Sheet Items  
Regionals  
(\$ Millions)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
REG REGIONALS												
TOTAL CURRENT ASSETS	2.04	2.70	2.37	3.45	3.73	4.37	4.93	7.95	11.05	18.94	25.33	52.74
TOTAL INVESTMENTS AND SPECIAL	1.066	0.970	0.823	0.854	1.741	0.831	1.037	1.016	1.350	2.510	2.255	4.665
TOTAL OPERATING PROPERTY AND	3.02	3.05	3.19	2.87	6.19	7.62	7.90	16.29	21.76	40.81	77.47	179.58
TOTAL NONOPERATING PROPERTY A	0.793	0.679	0.727	0.604	0.470	0.948	0.037	0.422	0.323	1.717	0.065	1.086
TOTAL OTHER ASSETS	0.15	0.15	0.17	0.14	0.29	0.26	2.29	0.92	1.26	1.91	3.43	7.81
TOTAL ASSETS	7.049	7.546	7.209	7.916	12.324	14.027	16.195	26.598	35.594	65.888	108.542	236.577
TOTAL CURRENT LIABILITIES	1.66	1.68	1.58	1.70	4.45	3.67	5.85	9.65	12.74	24.86	32.98	68.77
LONG-TERM DEBT	0.959	0.952	1.095	0.956	2.474	3.672	3.798	6.911	10.137	21.423	24.136	58.960
TOTAL NONCURRENT LIABILITIES	0.96	0.97	1.09	0.96	2.48	3.67	3.80	7.58	12.10	22.95	54.80	131.09
TOTAL DEFERRED CREDITS	0.340	0.330	0.273	0.249	0.303	0.710	0.789	1.324	0.954	0.948	1.025	4.093
NET STOCKHOLDERS' EQUITY	4.09	4.37	4.32	5.01	7.07	8.10	5.76	8.03	9.80	17.12	19.73	41.48
TOTAL LIABILITIES AND STOCKH	7.049	7.546	7.209	7.916	12.324	14.027	16.195	26.598	35.594	65.888	108.542	236.577

	1980	1981
REG REGIONALS		
TOTAL CURRENT ASSETS	118.34	120.40
TOTAL INVESTMENTS AND SPECIAL	23.244	9.664
TOTAL OPERATING PROPERTY AND	393.93	382.13
TOTAL NONOPERATING PROPERTY A	3.787	3.351
TOTAL OTHER ASSETS	22.08	13.51
TOTAL ASSETS	551.379	529.063
TOTAL CURRENT LIABILITIES	139.56	108.56
LONG-TERM DEBT	239.477	215.614
TOTAL NONCURRENT LIABILITIES	328.27	287.71
TOTAL DEFERRED CREDITS	18.294	22.948
NET STOCKHOLDERS' EQUITY	67.48	109.85
TOTAL LIABILITIES AND STOCKH	551.379	529.063

Source: I.P. Sharp, CAB Form 41.

Selected Balance Sheet Items  
Cargo  
(\$ Millions)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
COO SYSTEM ALL CARGO											
TOTAL CURRENT ASSETS	70.23	82.59	76.83	98.66	86.32	107.14	105.06	109.73	133.73	162.93	190.10
TOTAL INVESTMENTS AND SPECIAL	52.876	34.617	48.404	39.401	109.616	124.511	95.340	99.995	112.976	41.026	34.516
TOTAL OPERATING PROPERTY AND	224.60	279.97	236.26	216.51	174.64	146.94	212.81	178.13	211.73	252.73	378.35
TOTAL NONOPERATING PROPERTY A	3.648	19.864	28.152	31.780	3.296	2.025	1.799			18.922	81.220
TOTAL OTHER ASSETS	23.86	21.78	17.86	11.70	9.59	7.96	4.07	4.12	5.37	4.01	2.96
TOTAL ASSETS	377.214	438.917	407.505	398.049	383.462	388.577	417.275	391.971	463.812	479.619	687.150
LONG-TERM DEBT	41.09	63.99	58.55	59.05	54.93	69.67	73.10	63.98	75.24	95.00	129.55
TOTAL NONCURRENT LIABILITIES	203.053	261.161	210.108	187.376	136.386	115.568	129.235	102.289	175.622	129.499	168.769
TOTAL DEFERRED CREDITS	205.27	242.49	237.98	216.90	166.62	146.53	159.90	108.15	183.09	159.19	298.75
NET STOCKHOLDERS' EQUITY	19.958	29.370	35.579	39.085	43.245	43.676	57.132	60.861	20.866	12.889	25.822
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	90.89	82.97	86.02	108.47	118.68	129.65	127.14	153.98	184.62	213.54	233.03
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	377.214	438.817	407.505	398.049	383.462	388.577	417.275	391.971	463.812	479.619	687.150

	1979	1980	1981
COO SYSTEM ALL CARGO			
TOTAL CURRENT ASSETS	209.02	200.37	217.71
TOTAL INVESTMENTS AND SPECIAL	54.798	60.476	68.177
TOTAL OPERATING PROPERTY AND	627.58	781.37	844.36
TOTAL NONOPERATING PROPERTY A	101.615	64.775	18.551
TOTAL OTHER ASSETS	9.15	70.26	69.13
TOTAL ASSETS	1002.158	1177.254	1217.933
LONG-TERM DEBT	218.79	213.47	240.18
TOTAL NONCURRENT LIABILITIES	364.963	293.878	319.167
TOTAL DEFERRED CREDITS	481.27	641.11	642.14
TOTAL DEFERRED CREDITS	37.136	39.345	15.005
NET STOCKHOLDERS' EQUITY	264.97	283.33	320.61
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	1002.158	1177.254	1217.933

Source: I.P. Sharp, CAB Form 41.

FOOTNOTES

Statement of Changes in Financial Position  
Industry  
(\$ Millions)

	1974	1975	1975	1977	1979	1979	1980	1981
NET INVESTMENT CAPITAL	-64.28	-77.12	1132.18	640.74	1217.30	852.13	96.23	155.10
RETURNS	291.738	1095.452	1123.555	1152.474	1413.535	1597.482	1207.975	1404.670
RECAPITALIZATION	15.94	33.93	37.00	58.59	200.22	195.83	251.60	176.79
DEFERRED FEDERAL INCOME TAXES	-13.736	9.466	135.243	93.750	70.035	-134.058	-39.790	30.932
DEFERRED INVESTMENT TAX CREDIT	2.01	1.14	22.55	50.09	15.54	20.42	24.55	26.10
OTHER OPERATIONS	-1.102	5.971	-125.342	-154.287	-231.938	-165.627	-247.513	-122.349
TOTAL FROM OPERATIONS	220.52	1072.75	1569.57	1441.31	2697.22	1965.50	1942.93	1730.54
ACQUISITION OF PROPERTY & EQUIP.	101.587	583.555	367.575	382.380	502.121	407.159	416.731	455.250
INVESTMENTS AND SPECIAL FUNDS	145.10	607.84	455.93	315.17	270.36	673.39	604.83	306.94
LONG-TERM DEBT INCURRED	144.458	621.659	722.153	1035.585	1497.333	3130.453	4020.035	2719.554
CAPITAL STOCK ISSUED	40.47	9.14	9.98	287.04	149.27	109.62	256.90	264.59
OTHER SOURCES	105.755	170.405	172.844	119.854	857.551	376.771	574.002	456.910
TOTAL SOURCES FROM CAPITAL	757.94	3056.85	3342.47	4027.49	5989.83	6674.91	9121.46	5474.01
ACQUISITION OF PROP. & EQUIP.	435.534	1530.945	1005.544	2236.151	3551.331	4538.389	5247.010	3137.405
INVESTMENTS AND SPECIAL FUNDS	57.25	392.40	544.37	282.30	433.55	456.40	328.54	267.85
REDEEMPTION OF LO	104.749	730.264	1145.447	1142.553	1365.657	1455.932	2074.237	1404.044
REDEMPTIONS RECALLED (NOT STOCK)	70.76	67.25	72.58	107.94	144.74	157.74	172.44	114.53
OTHER APPLICATIONS	49.219	201.330	235.705	213.165	795.522	317.498	242.287	247.956
TOTAL APPLICATIONS	611.51	2326.99	3030.74	3982.07	6280.77	7463.55	8859.21	5807.20
CHANGE (INCREASE) IN NETWORTH	53.928	137.870	242.836	51.895	-301.034	-715.011	-739.123	-159.218

Source: I.P. Sharp, CAB FORM 41.

Statement of Changes in Financial Positions  
Majors  
(\$ Millions)

	1974	1975	1976	1977	1978	1979	1980	1981
NET INCOME	-57.35	-206.70	871.25	599.74	1106.47	286.53	48.96	43.76
DEPRECIATION	252.402	1027.325	1029.675	1052.251	1209.121	1406.545	1541.710	1269.309
AMORTIZATION	9.40	24.69	24.14	51.25	140.79	154.76	179.35	132.25
DEFERRED FEDERAL INCOME TAXES	-21.254	1.673	123.403	75.570	59.585	-150.944	-122.873	4.521
DEFERRED INVESTMENT TAX CREDIT	2.91	1.14	24.55	44.42	15.54	25.20	22.74	24.31
OTHER OPERATIONS	-1.393	9.383	-138.100	-178.051	-232.476	-197.462	-234.363	-111.745
NET FUND OPERATIONS	111.40	942.51	1493.78	1450.91	2364.91	1515.22	1416.05	1287.41
ADJUSTMENT OF PROPERTY & EQUIP.	70.716	493.720	230.575	326.505	413.690	273.795	671.337	264.811
ADJUSTMENTS AND SPECIAL ITEMS	135.15	554.43	361.99	153.87	159.47	445.84	546.54	240.20
DISCONTINUED NET INCOME	113.931	503.351	540.369	837.997	425.350	2753.150	2434.953	1341.595
NET STOCK ISSUED	40.39	9.22	8.73	205.53	127.39	45.96	143.34	41.53
OTHER BUSINESS	100.911	135.431	71.055	87.421	684.533	248.781	301.104	341.657
NET STOCKS ISSUED	697.40	2645.65	2716.41	3362.52	4575.27	4032.77	5013.25	3705.90
ACQUISITION OF PROP. & EQUIP.	393.109	1345.567	948.213	1911.500	2714.813	2431.989	4483.945	2412.720
ACQUISITIONS AND SPECIAL ITEMS	44.58	321.16	394.51	174.32	215.91	727.86	204.47	75.47
ACQUISITION OF STOCK	173.448	691.035	1008.442	1091.574	1100.607	1021.675	1577.702	1044.976
ACQUISITION OF STOCK	53.80	62.21	58.97	95.24	124.50	170.49	94.13	65.70
NET APPLICATIONS	40.724	167.785	144.195	163.318	503.336	202.715	115.995	170.770
NET APPLICATIONS WORKING CAP	712.76	2541.75	2485.24	3345.98	4439.17	5604.58	6490.28	3734.65
INCREASE (DECREASE) IN WORKING CAP	35.743	103.294	239.475	15.340	-253.905	-700.147	-557.035	-87.944

Source: I.P. Sharp, CAB Form 41.

Statement of Changes in Financial Position  
Regionals  
(\$ Millions)

	1974	1975	1976	1977	1978	1979	1980	1981
Net Income	-5.47	-1.97	-1.34	3.45	2.27	3.72	-21.85	-0.12
Provision	0.103	1.99	2.496	4.957	8.12	17.917	24.312	13.797
Amortization	0.01	0.23	0.28	0.54	0.67	0.55	3.35	3.79
Interest Expense			-0.370	0.030	0.33	1.716	3.335	0.512
Interest Income						0.74	0.95	0.40
Other Income	0.945	0.51	0.611	0.992	2.565	3.267	4.963	-1.240
Other Expense	-0.15	0.45	1.55	10.41	13.83	27.75	15.26	8.63
Income Tax Expense	0.110	0.393	2.455	3.337	6.63	6.247	9.333	14.843
Income Tax Benefit		0.02	0.20	1.76	0.35	1.78	12.84	1.70
Income Tax Expense	0.223	4.997	5.264	9.904	41.122	61.032	134.305	35.168
Other Income		0.41	0.50	0.35	0.70	1.75	40.40	27.72
Other Expense		6.859	4.076	2.215	0.73	3.129	21.980	2.088
Acquisition of Prop. & Equip.	-0.02	14.21	14.42	27.13	57.57	104.74	237.74	90.15
Investments and Capital Funds	0.476	6.320	9.602	17.156	44.897	73.353	172.265	42.798
Investment Redemption of L.O.	0.02	0.03	0.15	1.38	0.76	3.45	5.34	1.54
Dividends Declared (Net Stock)	0.207	3.454	2.784	9.456	9.759	26.457	50.152	24.754
Other Application	0.440	3.324	2.154	0.10	0.27	0.02	-0.15	0.11
Total Application Working Cap	1.14	13.20	14.50	29.50	58.52	105.72	15.737	14.436
Increase (Decrease) in Net Worth	-2.154	1.025	0.401	-2.270	-1.732	-0.055	-5.657	-0.126

Source: I.P. Sharp, CAB Form 41.

Statement of Changes in Financial Position  
Card 2  
(\$ Millions)

	1974	1975	1976	1977	1978	1979	1980	1981
ALL CARGO	0.06	9.02	12.05	34.29	36.90	15.54	-17.36	-11.45
EXPENSE	5.729	23.750	22.725	24.455	31.462	37.857	-1.751	21.141
INVESTMENT	4.37	0.45	3.34	3.56	46.74	71.66	50.23	12.27
NETTED FISCAL INCOME TAXES	-1.800	2.342	11.547	4.794	4.355	14.364	5.577	-9.904
NETTED INVESTMENT TAX CREDIT	-0.411	-10.759	-1.791	-3.278	2.095	-2.37	0.43	-7.14
STATE OPERATIONS	8.71	25.34	54.87	64.08	122.06	97.43	22.70	14.27
TOTAL FIRM OPERATIONS	9.430	35.303	19.043	23.240	17.120	17.648	53.742	17.448
RETIREMENT OF DEBT + EQUITY	8.59	18.46	31.61	131.32	45.95	36.80	5.46	4.00
PROVISION AND SPECIAL FUNDS	10.577	97.950	17.672	178.093	271.472	45.926	13.462	
INVESTMENT DEBT EXCHANGED								
CAPITAL STOCK ISSUED					0.70	14.49	20.85	
OTHER SOURCES	0.025	10.411	39.387	12.634	131.054	1.530	117.110	0.126
TOTAL SOURCES EXCLUDING CAPITAL	33.16	100.44	233.87	248.46	444.48	434.37	796.74	55.76
ACQUISITION OF PROP. + EQUIP.	11.553	16.475	59.317	105.015	208.326	295.552	575.744	34.649
INVESTMENTS AND SPECIAL FUNDS	0.54	15.62	95.15	60.95	50.11	64.24	15.12	5.26
DEBT RETIREMENT OF LOANS	12.126	38.178	17.617	47.734	45.943	43.402	13.719	70.768
DEBT STOCK EXCHANGED	5.00	1.80	5.50	9.50	7.44	2.08		
OTHER APPLICATIONS	0.905	15.324	58.234	16.321	144.010	56.958	11.438	0.442
TOTAL APPLICATIONS EXCLUDING CAP	29.33	87.41	271.82	239.52	456.90	504.69	541.02	111.01
INCREASE (DECREASE) IN WORKING CAPITAL	4.024	13.976	12.049	9.435	-11.203	-70.319	-55.237	-55.255

Source: I.P. Sharp, CAB Form 41.

APPENDIX IV-B

S&P 500

The Standard & Poor's 500 (S&P 500 or "500") is a stock price index whose purpose is to portray the pattern of stock price movement. It is generally used to measure market performance. The "500" is made up of 400 industrial, 40 financial and 20 transportation companies and 40 public utilities. The Index is not the 500 largest companies listed on the New York or other stock exchanges but the issues of the 500 do represent about 75 percent of the aggregate market value of common stocks traded on the New York Stock Exchange (NYSE).

Companies are chosen with the aim of achieving a distribution by broad industry groupings that approximates the distribution of these groupings in the NYSE common stock population, taken as the assumed model for the composition of the total market. Each stock added to the Index must represent a viable enterprise and must be representative of the industry group to which it is assigned. The four major groups outlined above are divided into more than 90 subgroups. The composition of the "500" is continuously monitored by Standard & Poor with the objective of keeping it representative and up to date to combine the breadth, weighting and statistical integrity to portray the market's pattern of movement. A current listing of the firms included in the "500" and sub-groups, follows:

# Stocks in the S&P 500 Price Index

## — 400 INDUSTRIALS —

**AEROSPACE**—Boeing; General Dynamics; Grumman; Martin Marietta; McDonnell Douglas; Raytheon; Rockwell Int'l; United Technologies.

**ALUMINUM**—Alcoa Aluminum; Aluminum Co. of Amer.; Kaiser Aluminum; Reynolds Metals.

**AUTOMOBILES**—Amar Motors; Chrysler; Ford; Gen. Motors.

**AUTO PARTS (After Market)**—Champion Spark Plug; Eatin' Mfg.; Genuine Parts.

**AUTO PARTS (Original Equip.)**—Bosch Corp.; Dana; Eaton; Lib.-Quens-Ford; TRW Inc.; Timken Corp.

**AUTO TRUCKS & PARTS**—Cummins Engine; Freightliner; Paccar Inc.

**BEVERAGES (BREWERS)**—Anheuser-Busch; Coors (Delight); Pabst Brew; Schlitz.

**BEVERAGES (DISTILLERS)**—Heublein Inc.; Heil. Dist.; Seagram Ltd.; Walter.

**BEVERAGES (SOFT DRINKS)**—Coca-Cola; Dr. Pepper; General Cinema; PepsiCo Inc.; Royal Crown Co.

**BUILDING MATERIALS (AIR CONDITIONING)**—Flanders; Trane.

**BUILDING MATERIALS (CEMENT)**—Alpha Port. Industries; Ideal Basic; Kaiser Cement; Lone Star Indus.

**BUILDING MATERIALS (DIVERSIFIED)**—Amar Standard; Crown; Masco Corp.

**BUILDING MATERIALS (ROOFING & WALLBOARD)**—Jim Walter Corp.; Manville Corp.; Masonite; Nat'l. Gypsum; U.S. Gypsum.

**CHEMICALS**—Dow; Du Pont; Hercules; Monsanto; Stauffer Chem.; Union Carbide.

**CHEMICALS (MISC.)**—Alcona, Inc.; Allied Corp.; American Cyanamid; Celanese Corp.; FMC Corp.; Grace (H.R.) & Co.; PPG, Inc.

**COAL (BITUMINOUS)**—Eastern Gas & Fuel; No. Amer. Coal; Pittston; Westmoreland.

**COMMUNICATIONS—EQUIP/INSTR.**—M/A-Com Inc.; Northern Telecom; NOLAN Co.; Scientific Atlanta.

**COMPUTER SERVICES**—Automatic Data; Computer Sciences; Electronic Data Systems; Lyncshare.

**CONCRETE/REINFORCED**—Gulf & Western; IC Indus.; Int'l. Tel. & Tel.; Union Indus.; Northwest Indus.; Telsyn; Tensco Inc.; Telsyn.

**CONTAINERS (METAL PAIL/DRUM & BLASS)**—Amar Can; Const. Group; Crown Cork; Nat'l. Can; Quanta-M.

**CONTAINERS (PAPER)**—Bemis Co.; Diamond Int'l.; Federal; Maryland Corp.

**COPPER**—AMARCO Inc.; Newmont Mining; Phelps-Dodge.

**COSMETICS**—Albany-Culver; Avon; Church-Park's; Febreze Inc.; Int'l. Flavors & Fragrances; Revlon.

**DRUGS**—Amar Home; Bristol-Myers; Lilly (E.H.); March; Pfizer; Schering-Plough; Searle (E. D.); SmithKline Beckman Corp.; Squibb Corp.; Sterling; Upjohn Co.; Warner-Lambert.

**ELECTRICAL EQUIPMENT**—Emerson Electric; Gould Inc.; Granger (N. V.); McGraw Edison; Square D; Thomas & Betts.

**ELECTRONICS MAJOR COS.**—Gen. Elec.; RCA; Westinghouse Elec.

**ELECTRONICS (INSTRUMENTATION)**—Hewlett-Packard; Perkin-Elmer; Tektronix.

**ELECTRONICS (SEMICONDUCTORS/COMPONENTS)**—AMP Inc.; Intel Corp.; Motorola; Nat'l. Semiconductor; Texas Instruments.

**ENTERTAINMENT**—Columbia Pictures; Disney (Walt); MCA; MGM/UA Entertainment Co.; Warner Communications.

**FERTILIZERS**—Boehr Indus.; First Miss. Corp.; Int'l. Minerals & Chem.; Williams Cos.

**FOODS**—Archer-Daniels-Midland; Borden Foods; Borden; CPC Int'l.; Campbell Soup; Carnation; Consolidated Foods; Bort & Bort Inc.; Gen. Foods; Gen. Mills; Garber Prod.; Heinz (H.J.); Hormel Foods; Kellogg; Nabisco Brands Inc.; Norton Simon; Pillsbury; Quaker Oats; Ralston Purina; Stokely-Carm Corp.; Wm. Wm.

**FOREST PRODUCTS**—Boise Cascade; Champion Int'l.; Green Products; Georgia-Pacific; Louisiana-Pac.; Potlatch Corp.; Weyerhaeuser.

**RECORDING COS.**—Bobby Mfg.; Capson World; Records Int'l. (C.I. M.); World (M.I.).

**GOLD MINING**—ABA Ltd.; Campbell Red Lake; Dome; Homestake Mining.

**HOUSEBUILDING**—Carter Corp.; Kaufman & Broad; U.S. Home Corp.

**HOSPITAL MANAGEMENT**—Amar Med. Int'l.; Hospital Corp. of Amer.; Humana Inc.; Nat'l. Med. Enter.

**HOSPITAL SUPPLIES**—Abbott Lab.; Amar Hospital; Bard (C. R.); Baxter Travenol Lab.; Becton, Dickinson; Johnson & Johnson.

**HOTEL-HOTEL**—Hilton Hotels; Holiday Inns; Ramada Inns.

**HOUSEHOLD FURNISHING & APPLIANCES**—Bassett Furniture Int'l.; Maytag; Roper Corp.; Maytag Corp.; Whirlpool; White Consolidated Inds.; Zanussi.

**LEISURE TIME**—AMF Inc.; Brunswick; Henderson; Outboard Marine; Quaker.

**MACHINE TOOLS**—Acme Cleveland; Brown & Sharpe; Cincinnati Milacron; Giddings & Lewis; Monarch Machine Tool.

**MACHINERY (AGRICULTURAL)**—Allis Chalmers; Deere; Int'l. Harvester; Massey Ferguson.

**MACHINERY (CONSTRUCTION & MINERALS HANDLING)**—Bucyrus-Erie; Cater Trac.; Clark Equip.; Hydrac Co.; Raymond Inc.

**MACHINERY (INDUSTRIAL/SPECIALTY)**—Blacks & Stratton; Chicago Pneumatic; Combustion Eng.; Cooper Indus.; En-Coll-B; Foster Wheeler; Ingersoll-Rand; Jay Mfg.

**MEDICAL MISC.**—Amar Inc.; Norton Day Mfg.; UNCO Ltd.; Philips Corp.

**MISCELLANEOUS**—ARA Services; AT&T; Armstrong World; Black & Decker; Borg-Warner; Corning Glass; Eastman Kodak; Esmark; Fluor Corp.; Gillette; Harris Corp.; Honeywell Inc.; Minnesota Mining; Owens-Corning; Polaroid; Sherwin-Williams; Signal Cos.; Singer; Tandy.

**MOBILE HOMES**—Fleetwood Enterprises; Radman Inds.; Skyline.

**OFFICE & BUSINESS EQUIPMENT**—Burroughs; Control Data; Data General; Datapoint Corp.; Digital Equip.; Int'l. Bus. Mach.; NCR Corp.; Pitney-Bowes; Sperry Corp.; Storage Tech.; Wang Lab. CI B; Xerox Corp.

**OFFSHORE DRILLING**—Global Marine; Harding & Baine; SECO; Western Co. of North America.

**Oil (CRUDE PRODUCERS)**—Gen. Amer.; Louisiana Land & Exploration; Mesa Pet.; Superior Oil; Texas Oil & Gas.

**Oil (INTEGRATED-DOMESTIC)**—Am. Richmond; Cities Ser.; Getty Oil; Phillips; Shell; Stand. Oil Ind.; Standard Oil Ohio; Sun Co.; Union Oil of Cal.

**Oil (INTEGRATED-INTERNATIONAL)**—Exxon Corp.; Gulf; Mobil Corp.; Royal Dutch; Stand. Oil Calif.; Tanco.

**SEMI-CONDUCTOR & GAS EXPLORATION**—Bore Petroleum; Gulf of Canada; Husky Oil; Imperial Oil Ltd.

**Oil WELL EQUIPMENT AND SERVICES**—Boehr Int'l.; Dresser; Halliburton; Hughes Tool; McDermott Inc.; NL Industries; Schlumberger.

**PAPER**—Crown Zell.; Int'l. Paper; Varnado; Kimb-Clark; Mead; St. Regis; Scott; Union Camp; Wauson.

**POLLUTION CONTROL**—Browning-Ferris; Peabody Int'l.; Waste Management Inc.; Wastebrater-Fry; Zurn Ind.

**PUBLISHING**—Bun & Bradstreet; Harcourt Brace Jovanovich; Macmillan; McGraw-Hill; Meredith; SFH Co.; Time Inc.

**PUBLISHING (NEWSPAPERS)**—Dow Jones; Gannett Co.; Knight Ridder Newspapers; Times Mirror.

**RADIO-TV BROADCASTERS**—American; CBS Inc.; Capital Cities Comm.; Can Broadcasting; Metromedia; Taft.

**RAILROAD EQUIPMENT**—ACF Int'l.; Amtrak Indus.; Gen. Sig.

**RESTAURANTS**—Church's Fried Chicken; Denny's Inc.; Marriott; McDonald's Corp.; Wendy's Int'l.

**RETAIL STORES (DEPT. STORES)**—Alded Stores; Associated; Carter Hawley Hale Stores; Dayton Hudson; Federated; Macy; Marshall Field; May Dept.

**RETAIL STORES (DISCOUNT STORES)**—J&M Ind.; Zayre.

**RETAIL STORES (DRUGS)**—Edward (Jack); Revco U.S. Inc.; Rite Aid; Walgreen Co.

**RETAIL STORES (FOOD STORES)**—Amar Stores Co.; Great A. & P.; Jewel Companies; Kmart; Lady Stores; Safeway; Winn-Dixie.

**RETAIL STORES (GEN. MISC. STORES)**—A. Mart; Penney (J.C.); Sears; Wackenhut.

**SHOES**—Brown Shoe; Gossamer; Int'l. Shoe Corp.

**SNAPS**—Clavin; Cylgite-Palmolive; Foster & Gambell; Parn; Bulwer R.Y.

**STEEL**—Armco; Bath.; Inland; Inland; National; Republic; U.S. Steel; Wheeling-Pittsburgh.

**SUGAR REFINERS**—Amalgamated Sugar; Amstar Corp.; Holly.

**TEXTILES (APPAREL MFG.)**—Blue Bell; Chert; Peabody; Hart Schaffner & Marx; Jonathan Logan; Levi Strauss; VF Corp.

**TEXTILE PRODUCTS**—Burlington Indus.; Carr Mills; Lummus; Reeves; Springs Industries Inc.; Stevens; West Field-Pepperell.

**TIRES & RUBBER GOODS**—Firestone; Goodrich; Goodyear; Uniroyal.

**TOBACCO**—Amar Brands Inc.; Philip Morris; Reynolds Indus.

**TOYS**—Ideal Toy; Mattel, Inc.; Milton Bradley; Tonka Corp.

## — 40 PUBLIC UTILITIES —

**ELECTRIC POWER**—Amar El. Pow.; B&E; E. & E.; Const. & So. West. Corp.; Comm. Ed.; Con. Ed.; Detroit Ed.; Duke Power; Fla. Power & Light; Middle So. Ed.; New Eng. Elec. Sys.; Niagara Mohawk; N. States Pow.; Ohio Ed.; Pac. G. & E.; Phila. Elec.; Pub. Serv. E. & G.; Public Service of Indiana; So. Cal. Ed.; Southern Co.; Texas Util.; Va. E. & P.; West. El. Pow.

**NATURAL GAS DISTRIBUTORS**—Amar Natural Resources; Bays. Union; Columbia; Consolidated Natural; ENBRCH Corp.; Gasb. Int'l.; Pac. Light; Peoples Energy.

**NATURAL GAS PIPE LINES**—El Paso Co.; InterNorth Inc.; Panhandle Eastern; Sarnat Int'l.; Texas East. Corp.; Texas Gas Trans.

**TELEPHONE**—AT&T; Central Tel. & Util.; Const. Tel.; General Tel. & El.; United Telecommunications.

## — 20 TRANSPORTATION —

**AIR FREIGHT**—Emery Air Freight; Federal Express; Tiger International.

**AIR TRANSPORT**—American; Delta; Northwest; Pan Am; UAL Inc.

**RAILROADS**—Burlington Northern Inc.; CEX Corp.; Missouri Pac. Corp.; N. & W. & W.; Santa Fe Industries; So. Pac.; So. Ry.; Union Pac. Corp.

**TRUCKERS**—Const. Freightways; McLane Trucking; Roadway Express; Yellow Freight Sys.

## — 40 FINANCIAL —

**BANKS (NEW YORK CITY)**—Bankers Trust New York; Chase Manhattan; Chemical; Citicorp; Manufacturers Hanover; Morgan (J.P.) & Co.

**BANKS (OUTSIDE NEW YORK CITY)**—BankAmerica; Cent'l. N. Corp.; First Chic. Corp.; First Interstate Bancorp.; First Natl. Bank; First Penn.; InterFirst Corp.; Mellon Natl.; NCB Corp.; Northwest Bancorp.

**LIFE INSURANCE**—Capital Holding; Jefferson Pilot; Lincoln National Corp.; NYL Corp.

**SHORT-TERM INSURANCE**—Amar Life & Cos.; American Int'l. Group; American General; CIGNA Corp.; CNA Financial; Travelers.

**PROPERTY-CASUALTY INSURANCE**—Chubb Corp.; Continental Corp.; INA Corp.; St. Paul; Safeco Corp.; USF & S Corp.

**SAVINGS & LOAN HOLDING COS.**—Alliance (M.I.); First Charter; Great Western.

**PERSONAL LOANS**—Beneficial; Household Int'l. Inc.

**FINANCIAL MISC.**—American Express; Heller (Walter E.); Merrill Lynch; Transamerica Corp.

**BROKERAGE FIRMS**—Donaldson Lufkin & Jenrette; Edwards (J.G.); Hutton (E.I.) Group; Merrill Lynch; Paine Webber Inc.

**INVESTMENT COMPANIES**—Adams; Gen. Amer.; Lehman; Madison; M-Cent.

**INVESTMENT COS. (Bond Funds)**—American General Bond; Intercontinental Inc. Sec.; John Hancock Inc. Sec.; Massachusetts Inc. Inv.; Montgomery St. Inc. Sec.

**REAL ESTATE INVEST.**—Equitable Life; First Union Real Estate; Mass-Mutual Mfg. & Realty; May Mfg.; Wells Fargo Mortgage & Equity.

\*Not included in 400 Industrials.  
 \*\*Not included in Utility companies.  
 \*\*\*Not included in Financial companies.  
 (Supplementary Groups and Changes on Preceding Page)

CHANGES IN S&P 500 SINCE MARCH 3, 1982

Added (+)

Deleted (-)

Household Appl. & Furn.: (+) Bassett Furniture Ind., (+) Roper Corp., (+)  
Monasco; El. Instrum.; (-) Beckman Instrument; Pollution Control: (-)  
Envirotech Corp., (+) Zurn Ind.; Restaurant: (-) Gino's, (+) Wendy's Int.;  
Toys: (+) Mattel Inc.; Multi-Line: (+) CIGNA Corp.; Property-Casualty; (-) INA  
Corp.; Life Insur; (-) Conn. Gen.; Financial Misc.; (+) Merrill Lynch, Group  
Name Change; Elec. Household to Household Furnishing & Appl. Group Deleted;  
Home Furnishing Company Name Changes; SmithKline Corp. to SmithKline Beckman  
Corp.; Metro Goldwyn Mayer to MGM/UA Entertainment Co.; Springs Mills to  
Springs Industries Inc.

APPENDIX IV-C

INDIVIDUAL COMPANY ANALYSIS

## Introduction

The financial picture of the airline industry and carrier groups has been drawn with the use of CAB/carrier operations data. This "pure" data source, does not include transportation and non-transportation parents subsidiaries or affiliates, no matter how significant their role may be in the viability of the air carrier. The result is a snapshot of the industry in which the analyst can identify emerging airline trends. But the real world is not made up of air carriers whose only line of business is certified air transportation. Managements have made business decisions to expand, diversify, or disinvest, all decisions made in support of the major activity of air transportation. To analyze how the individual carriers responded to those factors which influenced the previously discussed industry performance and structure, the airline must be viewed in its real world form at the consolidated corporate level. The analysis is performed using the concepts and format employed in the main text for the industry and carrier groups. Here, individual airlines and the Standard & Poor's airline composite are studied. The airline composite includes those 45 airlines listed as in the tables following this appendix. All tabular data were obtained from Standard & Poor's Compustat Services which in turn obtains its data from company annual reports, SEC Form 10-Ks, 10-Qs, and CAB operational statistics reports. Additional descriptive data were obtained from the companies' annual reports. The companies covered in this discussion are those whose airline fleets included wide-body aircraft in 1981: American, Continental, Delta, Eastern, Pan Am, Trans World, and UAL.

## MAJORS

### American Airlines, Inc.

The plight of the airline industry was well outlined in the earlier sections. American Airlines generally fits the performance pattern of the industry. The recent levels of operational measures (load factor, RPM, ASM) surpass pre-regulation performance. What these data do not portray is the dollar side of the equation. With fare competition and inflation, American's operating ratio (0.96) reached an all-time high in 1980 and showed some improvement in 1981 (0.93), although the average depth of discount in fares increased to 42 percent in 1981, up from 35 percent in 1980. It was only in 1978 (the first time since 1972) that American managed to operate at less than 90 percent of revenues. Recent performance pegs American about at the level of the industry composite. The year 1980 was a poor one for American -- a negative 4.63% return on assets (ROA), nearly 180-degree turnaround from an ROA of 4.86% in 1978. Losses were previously experienced in 1975, 1973, and 1970. Compared to the airline composite, American was in a more favorable position by year end 1981 and 1979 though it suffered significantly in 1980.

Funds management figures show that American outperformed the airline composite except in 1980 and 1977. Operating funds provided about 40 percent of total capital resources since deregulation except in 1980: losses brought this ratio down to an eleven-year low of twelve percent (airline composite was 25 percent).

Capital expenditures relative to assets rose sharply in 1977 after remaining constant over 1973-76 though post-1977 levels have not yet reached

the pre-1973 level. In recent years, American's acquisitions to assets ratio was below the airline composite. Until 1981, American's fifteen percent closely approached the composite's sixteen percent. With above-average operating funds contribution rates and lower asset acquisition rates, it follows that American's acquisitions compare more favorably to operating funds than for the industry composite. The years that showed distortions in other capital expenditure measures show distortions here as well. In 1981, capital expenditures of about \$550 million included the acquisition of 23 B-727 extended version aircraft (of which 11 were used) and three B-747 freighter aircraft. In 1980 and 1979, capital expenditures of about \$420 million and \$500 million, respectively, partially included 23 B-727 extended version aircraft (of which four were used aircraft) and seven DC-10 aircraft. By December 1981, American estimated its future payments for aircraft and related equipment on order at approximately \$1.4 billion.

American is heavily debt financed -- more so than the industry composite from 1978 on. By year end 1981, American's debt/equity ratio peaked at nearly three and one half times equity; the industry was at three. Debt as a percentage of total invested capital was patterned the same. The long-term portion of that relatively higher debt burden has been somewhat lower than the industry's since 1978, though 1981 reversed slightly.

The effects of the debt burden are carried over into other indicators of risk. American has been able to cover interest on pre-tax earnings in almost every year since deregulation. Its liquidity position was better in that period as well but by no means can it be labeled "safe" from this perspective. American appears less risky than the industry.

American's executives announced that an operating margin of five percent

in the 1980s is necessary to finance its aircraft and maintain a competitive position in the decade ahead while providing a return to its stockholders. American did not achieve (in the airline segment alone) the five percent profit margin in 1981 and says that it does not expect to reach it in 1982 largely due to yield dilution, deep discount fare wars, mobility to negotiate, improved productivity with contract employees and continued weakness in the economy. As a result, American is re-evaluating its future capital commitments including deferring delivery or cancelling aircraft on order. In February 1982, American announced the discontinuance of plans to acquire 15 Boeing 757 aircraft and the deferral of delivery of certain Boeing 767.

Braniff International Corp.

The plight of Braniff is well known. Although Braniff ceased operations in May to file for corporate reorganization under court protection, a brief review of Braniff's situation at year end 1981 will be given to shed some light on the meaning of those measures used in this analysis.

For the second year in a row, Braniff's operating costs exceeded revenues by one percent in 1981. Losses relative to assets plunged to nearly sixteen percent in 1981 after recording a prior low of twelve percent in 1980. The net loss position generated an operating funds ratio of minus four percent in 1981 after hovering at or below zero in two previous years. Constrained in their funding, Braniff spent the equivalent of only one percent of assets on new equipment in 1981, a steep drop from earlier years.

External monies were apparently obtained to fund the losses which eroded the equity base -- debt jumped to over 27 times equity in 1981, compared to over four times in 1980 and nearly three times in 1979. (These numbers

reflect Braniff Airways, Inc. only. Figures for 1981 for the parent, Braniff International Corp. are not meaningful because there was virtually no equity investment left.)

Braniff's debt relative to total invested capital was 109 percent. If debt is a component of invested capital, how can it exceed the sum of itself plus equity? The answer lies in the fact that the equity position was wiped out by continuing losses; by year-end 1981, this was a negative amount. Braniff's debt represented almost the total investment in 1980 (at 94 percent). Braniff's long-term debt portion of total capital was 69 percent by the end of 1981; other airlines, healthy and not so healthy, have long-term debt ratios in excess of Braniff's in 1981. Standard & Poor's downgraded Braniff's debt in 1981, signalling further credit analysts' concerns.

The ability to fund interest payments disappeared in 1979. It is no wonder that in March, Braniff proposed to restructure its debt. The interest coverage ratio showed pre-tax, pre-interest losses one and one half times interest charges in 1981 and nearly one half in 1980 and 1979. Similarly, current liabilities exceeded current assets in every year since 1976. By December, 1981, current liabilities were almost twice assets. Again, other airlines posted worse results in this area.

#### Continental Airlines, Inc.

By year end 1981, Continental was on the list of ailing airlines despite Texas Air Corporation's (parent of Texas International and New York Air) partial ownership interests. The sharp reversal in its financial picture occurred after 1978. Operating profits were almost nonexistent for the past three years as seen by operating ratios of 95-99 percent. In prior years Continental's operating ratio edged up from a low of 80 percent in 1971 to a

high of 87 percent in 1978. Since 1978, Continental has performed worse than the airline composite with respect to its operating ratio. It follows that Continental's ROA has been negative in the past three years. Net losses were seven times assets in 1981. Operating funds were a decreasing source of funds over these three years, providing seventeen to nearly zero percent of total sources compared to 86 percent in 1978. Pre-1976 performance was weak.

Despite its inability to earn returns and generate funds internally, Continental resumed a relatively aggressive expenditure program in 1980 after slowing down significantly in the 1976-1979 period. Property and equipment purchases soared to 27 percent of assets in 1980, compared to an industry level of seventeen percent; in 1981, capital expenditures slowed to a rate of sixteen percent of assets--the industry average. Weak operating profits produced very high levels of expenditures relative to funds provided by operations -- in 1981 there were \$461.00 dollars spent on new equipment for each dollar of operating funds; in 1980, it was \$9.75 to \$1.00. The industry average was close to a three-to-one ratio. Fluctuations occurred prior to 1979 but variation from the industry was not as wide in the earlier years.

Historically, Continental relied more on debt than equity financing. Airline composite showed debt to equity at 2:1 to 3:1 since 1969; Continental showed ratios from 3:1 to 5.6:1, the worst year being 1981. This translates into total debt capitalization of 85 percent in 1981, the highest in the carrier's history. The long-term debt portion of total investment was a low 21 percent by the close of 1981, less than half the prior year's and an historical low.

The effect of poor earnings power seen in the operating ratio and ROA measures is reflected in the interest coverage ratio. Pre-tax, pre-interest

earnings were insufficient to cover interest expense in 1981 and 1979 while just barely providing enough earnings to cover interest in 1980. Prior years were, in general, significantly better although below the industry average. Only once in the past thirteen years could Continental's current assets cover current liabilities -- 1971. The steepest drop in the current position occurred between 1980 and 1981 when the ratio fell from 73 percent to 39 percent; this compared to the industry's fall from 90 percent to 77 percent.

By the close of 1981, Continental's outside auditors qualified their financial statements, placing doubt on the carrier's ability to continue as a viable entity. Standard & Poor's credit rating service downgraded Continental's debt from B to CCC, the same measure taken for Braniff and Western.

#### Delta Air Lines, Inc.

The gloom and doom tones reserved for Braniff, Continental, and others on the critical list are unnecessary for Delta, at least through fiscal year end 1981.<sup>1</sup> With one of the industry's lowest operating ratios in 1981 (89 percent), Delta also showed one of the highest rates of return (6.36 times assets). In both instances, Delta outperformed the airline industry composite. With favorable results as this, Delta traditionally has provided the majority of its funds from operations -- 84 percent in 1981, 76 percent in 1980, 93 percent in 1979 . . . with a low of 50 percent in 1974. This compares to the industry's 1981 rate of 26 percent and an historical high of 55 percent in 1977. Nonetheless, Delta's equipment purchase programs were not

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<sup>1</sup> Delta's fiscal year is July 1 - June 30.

aggressive when compared to the industry composite: from 1978 on asset replacement rates ranged from twelve to twenty percent for Delta and fifteen to eighteen percent for the industry; 1974-1977 appeared to be a period of relatively high equipment acquisition. These purchases could have been funded entirely out of operating funds (and were, as will be seen from Delta's debt load) after 1978. Delta appears to take a conservative approach to investment management, financing capital investment largely out of internal funds, especially after 1978. Only in the mid-1970s did Delta's investment-to-operating funds ratio surpass the industry's.

Delta's ability to fund from within can more clearly be shown in its debt ratios. Although total debt reached 1.8 times equity in 1975 and again in 1969, the past four years saw total debt at 1.1-1.2 times equity; only Northwest (of the Majors) can boast lower debt-to-equity relationships. Debt as a percentage of total capitalization hovered around 55 percent in the past five years. Again, only Northwest showed lower debt capitalization ratios. It is interesting to note that lenders are now calling for a 50-50, at worst a 60-40 debt-equity split on airline balance sheets if they are to obtain new financing. The only Majors which appear to meet this criterion are Delta, Northwest, and US Air.

Debt represented 55 percent of total investment in Delta in 1981. Long-term debt was 29 percent, compared to the industry level of 44 percent. The combination of a strong balance sheet and (airline) respectable returns produced a strong pre-tax, pre-interest debt-service coverage factor of 10.63 times in 1981. Not once in thirteen years did this factor fall below three times while the industry composite showed a factor as high as three in only two years in that period.

Delta's current ratio surprisingly has not surpassed a value of one since 1970. Further analysis of Delta's balance sheet accounts is required to determine the cause of this apparent inconsistency.

Delta's strong position is enhanced by the fact that its current (1981) inventory includes only two leased aircraft (B727). Claims on funds are restricted to relatively low debt repayment and service, operating costs, and new investment.

### Eastern Air Lines

Eastern wound up 1981 somewhat below the industry but by no means in as critical conditions as Braniff. Operating efficiency declined since 1978 with operating ratios edging up from 89 percent in 1978 to 95 percent in 1981; only in 1975 and 1973 did operating profits decline to a level of about five percent of revenues. Surprisingly, Eastern performed about as well as the industry, if not better, in the past three years; prior, it performed under the industry with regard to operating ratios. Returns on assets steadily deteriorated after 1978, doing better than the industry in 1979 but worse in 1980 and 1981. ROA fell to a six-year low of -2.24 percent in 1981; 1975 and 1973 posted even lower ROAs.

With respect to funds flows, Eastern tended to follow the industry pattern. A noticeable decline in operating funds relative to total sources occurred after 1978, from 43 percent to 26 percent in 1981; the industry registered a drop from 52 percent to 26 percent between those years. Other sources would, intuitively, be required when the asset replacement rate (capital investment/total assets) rose from a level of five to eight percent during 1974-1977 to about twenty percent during 1978-1981. The current rate ratio has consistently been above the industry (fifteen to eighteen percent) while

in the earlier period, below the industry (eleven to thirteen percent). Capital expenditures generated at this rate produced investment levels nearly three and one half times internally generated funds in 1980 and 1981, and nearly two times in 1978 and 1979. There were only three instances in the past eleven years that this rate dropped below 159 percent. Relative to the other Majors, Eastern exhibited nearly the highest rate of investment relative to earnings ability.

Losses and equipment acquisitions reflecting Eastern's long-term modernization program made Eastern go to debt financing. Although Eastern improved what was otherwise a worsening debt structure in 1971, 1976-1977, and 1980, the significant jumps occurred in 1978 (from 2.2 to 3.3), 1979 (3.3 to 4.0), and 1982 (3.9 to 5.0) when comparing total debt to equity. The industry recorded its worst year in 1981 at three times as much debt as equity. When invested capital is viewed as debt and equity combined, Eastern's reliance on the credit markets is supported further: by the end of 1981 debt accounted for 83 percent of total invested capital, up from the 1977 level of 69 percent; the industry closed 1981 with 75 percent debt up from 69 percent in 1978. Because of Eastern's high rate of equipment investment relative to earnings, it is not surprising to find long-term debt at higher-than-average levels (58 percent versus 44 percent of total invested capital in 1981). Since 1979, Eastern was able to raise these funds largely through European export credit agencies and lease financing. At year end 1981, Eastern had commitments estimated at \$1.4 billion to purchase 40 aircraft and spare support and engine programs over 1982-1985.

Eastern's ability to fund current obligations deteriorated significantly after 1979, the same time the market for air travel softened. Between 1976

and 1978, earnings before interest and taxes ranged from one and two-thirds to twice the interest charges. By 1981, it was somewhat more than half. In the past two years, Eastern's interest-coverage ratio fell under the industry's. The current ratio drops sharply only after 1980 from 1.04 to .87. The important point here is that Eastern appears to establish a pattern of low current ratios (relative to broad indicators) even in healthier times.

In December, 1981, leased aircraft accounted for 23 percent of Eastern's fleet of 278 aircraft. Overcapacity induced Eastern to either sublease or arrange sale of some of its fleet. Four of its L-1011s are leased to foreign carriers. Nine of its 727s were grounded by late 1981, later sold as scrap in April 1982.

#### Northwest Airlines, Inc.

Northwest emerged from 1981 in a sound position for a Major airline although straddled with labor problems. Showing one of the strongest operating ratios for a Major (93 percent), Northwest operated at a higher cost level in 1981 than it did between 1974 and 1979, with operating ratios in the high 70s and low 80s. The decreasing operating profitability in 1980 and 1981 and 1982 is reflected in its performance measures. Over the ten-year period 1969-1979 earnings were two to seven times assets; the industry composite rose above two only in the three-year period of 1976-1978. When industry losses plummeted to about one third of assets in 1980, Northwest's earnings dropped to about half of assets; in 1981, the industry's ROA declined further--losses averaged about one and a half times assets but Northwest's earnings rose to about three-quarters of its asset base. Of the Majors, only American joined Northwest in showing an improved ROA.<sup>1</sup>

<sup>1</sup> Delta showed an increase for its fiscal year 1981 as well. However, Delta's Fiscal year is not comparable to Northwest's and American's.

Investment programs and debt management appear to be conservative -- probably the most conservative in the industry. Operating funds have over the last five years provided more than 90 percent of Northwest's total funds. No other airline has showed such consistent reliance on internal funds although Delta follows with its highest rate closest to Northwest's lowest. Investment in new equipment has been slow paced; compared to internal funding ability, Northwest invested at only 36 percent in 1981 after two years of more intensive capital spending in 1979-1980 (170-280 percent) and a steadier five year history of about (100 percent). Relative to total assets, 1981 was a very slow year for capital expenditures but prior years rates, on the whole, did not show significant downward variation from the industry.

Northwest's strategy then has been to fund itself out of earnings and operations. In the past eight years, debt has not exceeded equity. Of the Majors, Northwest had the least amount of debt (79 percent of equity) in 1981; of all the airlines in the composite, only Southwest had less relative debt (65 percent of equity) though this was its finest year below 100 percent while Northwest has repeatedly been below this mark.

Northwest's financial structure falls within the "safe" range (50 percent debt, 50 percent equity). By 1981, total debt provided 44 percent of total capitalization and only once in thirteen years has debt even barely risen above 50 percent. Only Northwest is so unencumbered by debt.

Even so, Northwest's debt is largely current--not long-term obligations. Long-term debt was nineteen percent total capitalization by year end 1981--once again the lowest. Long-term debt accounted for more of Northwest's total debt in the past but it has remained fairly stable at 28-34 percent over 1974-1979.

Given this favorable structure, liquidity measures might be expected to be equally favorable. Prior to 1980, lenders were well covered for interest expense. The pre-tax loss suffered in 1980 produced a poor interest-coverage ratio (-0.88 percent) after a strong ten-year experience. The current ratio dropped markedly after 1979, putting Northwest under the industry.

Northwest's key characteristic is its low debt, especially that payable over the long-term and an established policy of funding growth and replacement internally. Furthermore, by year end 1981, Northwest had no leased aircraft to place claims on internal funds, putting it ahead of most other carriers when evaluating new equipment programs.

#### Pan American World Airways, Inc.

Pan Am's recent history is an exercise of investment strategies. Determined to make National Airline's routes work for Pan Am, the official merger between the two occurred on December 31, 1979. One year later, Pan Am sold its interest in the Pan Am Building to record a nearly \$295 million gain. Then in September 1981, only nine months later, Pan Am sold off its wholly owned hotel subsidiary for an after-tax gain of \$222 million. This new Pan Am, stripped of its major non-airline subsidiaries, now includes airline and contract service operations only. This occurs at a time when Pan Am's operating ratio is on an upward move, from 90 percent in 1979 to 103 percent in 1981. It is difficult to pinpoint the reason for Pan Am's weakening in 1979--in general, the airlines had lackluster performance in 1980 and 1981, but Pan Am also acquired National at this time. The combined effect has hurt Pan Am which in turn tried to ease the situation by selling of assets in return for cash.

The Pan Am Building sale improved 1980's ROA despite the fact that

operating profits were only three percent of revenues. In fact, the 1980 ROA was relatively consistent with the past few years. However, the staggering losses experienced by the airlines in 1981 were felt by Pan Am despite the sale of more assets. Pan Am recorded a return of a -8.76 times its asset base -- only Braniff (-15.93) and Western (-8.80) reported worse results, and these carriers' auditors qualified their financial statements.

The significant gains included in net income clouded internal funding ability measures. Although operating funds (which include net income) declined as a source of funds, the dramatic decline did not appear until 1981 and then it was softened by one-time asset disposition or tax gains. Through most of the 1970s, operating funds provided 40-50 percent of total sources (except 1974, when it hit a low of -35 percent). This fell to 37 percent in 1980 following a seven-year high of 55 percent; in 1981, operating funds represented a minus three percent of total sources.

Pan Am operated under conflicting aims over periods of the 1970s. An expansion program begun in the late sixties finally was curtailed in 1972. That rate picked up again in 1974-1975 while Pan Am was still recording net losses. The restraint imposed in 1978 was not to last long nor were its ordinary earnings level of 1976-1979. Pan Am's current low level of investment (thirteen percent of total assets) is and has been below the industry composite since 1971.

An obvious attempt to reduce debt has been made since the 1970s. From a thirteen-year high of 4.73 times equity. Pan Am's 1981 debt reached 2.77 times over an almost steady six-year decline. This means that total debt is 73 percent of total investment--still below the industry but highly leveraged for lenders. More than half of this debt is long term (43 percent of total

capitalization is long-term debt); this level is Pan Am's thirteen-year historical low! The quality of Pan Am's debt was seen to be diminishing by Standard & Poor's rating service in 1981; Pan Am's rating was reduced to B from BB.

Its liquidity position was impaired by the loss effects--there were no pre-tax, pre-interest earnings in 1981, the first time since 1975. The high level of debt and steep losses put Pan Am in the second worst position with respect to its interest coverage ability (-2.00 times)--only Braniff came near this at -2.15 times.

The "unpredictable" current ratio shows current assets at 80 percent of current liabilities, another historical low. Pan Am, however, showed one of the strongest records in its current position until 1979.

Almost a third of Pan Am's fleet is leased, most of which is B747s, and not all of which are included as capitalized leases or debt. The additional drain from debt and operating leases may require Pan Am to reduce its size in the 1980s as it did during the 1970s.

#### Trans World Corp.

Trans World Airlines, Inc. was restructured in 1979 into Trans World Corp., holding company, operating through its airline, hotel, and food services subsidiaries in addition to its then newly acquired vending and real estate subsidiaries. The table below shows the segment distribution of revenues, operating income and identifiable assets for the period 1978-1980.<sup>1</sup>

<sup>1</sup> Income before interest, taxes and extraordinary items; total includes non-traceable or "corporate" net assets, etc.

Table 2

Trans World Corporation  
Line of Business Report

	<u>1978</u>	<u>1979</u>	<u>1980</u>
<b>REVENUES</b>			
Airline Services	68.7%	68.4%	67.2%
Food Services	17.6%	18.6%	19.5%
Hotel Services	13.6%	12.8%	12.5%
Real Estate	-	0.2%	0.8%
<b>OPERATING INCOME</b>			
Airline Services	51.9%	nm <sup>2</sup>	8.6%
Food Services	15.4%	38.4%	32.4%
Hotel Services	32.7%	63.1%	53.3%
Real Estate	-	1.7%	5.7%
<b>ASSETS</b>			
Airlines	73.4%	66.7%	70.2%
Food Services	9.7%	13.5%	13.3%
Hotel Services	10.6%	9.3%	8.2%
Real Estate	-	3.2%	3.0%

nm = not meaningful

Trans World's consolidated results of operations show the benefits of diversification out of airline services into food, hotel and real estate services. Consolidated operating profits slightly outperformed the airline composite in 1981 and 1980 while trailing the composite group in earlier years (two profitable subsidiaries were acquired in the latter part of 1979). Similarly, returns assets showed much better results for Trans World Corp. than airline composite, largely because of the profitability in other business

<sup>2</sup> Not meaningful; airline services sustained a net operating loss of \$3 million compared to operating income for food services of \$36.5 million, hotel services, \$59.9 million, real estate services, \$1.7 million.

segments. Rebounding after its 1979 return of 31 percent on assets (1970, 1971, 1974 and 1975 were worse), Trans World's return on assets increased to 124 percent in 1981. Of the Majors, Trans World ranked third in ROA following U.S. Air and Delta.

The ability to generate earnings provided more flexibility in funding sources. Following Delta and Northwest, Trans World's operating funds provided about 40 percent of total sources in 1981, compared to the industry average of 26 percent. This is a decline from levels of 54-68 percent in 1974-1976. Capital expenditure rates clipped along in the early seventies in spite of suffering earnings. After 1975's record loss of 4.5 times assets and investment nearly 15 times operating funds, a leveling off occurred over the next three years, showing restraint relative to the other carriers. The trend reversed in 1979 partly in response to the changed line-of-business profile the corporation was developing, although airline capital expenditures accounted for the bulk of the corporate total (70-83 percent).

Trans World has one of the highest debt burdens off the airline critical list (i.e., Braniff, Continental, Western) regardless of repeated attempts to bring down the outstanding debt by selling preferred stock (1977), prepayment of long-term debt (1981) and exchange debt for convertible debt (1980). By year end 1981, Trans World's debt was about 3.2 times equity - the industry showed about 3 times. This represented an improvement over most of the past ten years.

Since the shopping trips for subsidiaries in 1979, Trans World's long-term portion of debt remained relatively stable at 44-46% of total investment, close to the trend set by the industry composite. Prior to this, Pan Am's long-term debt rose significantly above the industry's.

Cash infusions from asset sales and high turnover subsidiaries allowed Trans World to more than break even after allowing for interest charges (as measured by the ratio of earnings before interest and taxes to interest charges). Of the Majors, only Delta outperformed Trans World in this area. The ability to pay currently maturing obligations detracts from Trans World's rosy picture - current assets were about 90% of liabilities in both 1980 and 1981; current assets are not all readily convertible to cash to meet the obligation.

TWA's fleet size was 221 at year-end 1981; of this about one-fourth were leased aircraft. Of the total 221 aircraft, 190 were in revenue operations, down from 201 in 198 and 1979. Its fleet modernization program calls for 13 new aircraft (L-1011s and B-767) to be delivered over 1982 and 1983 worth about \$570 million. In addition, TWA had options on, among others, 10 Boeing 767s which it later rescinded, responding to the lessons of overcapacity from the 1970s.

The marginal airline improvement which still left TWA with a net loss was hedged in 1981 at the parent (Trans World Corp.) level. The insulation provided from food, hotel and real estate services provided a cushion against airline volatility.

#### UAL, Inc.

UAL, a holding company, is the parent of United Airlines, Inc., Westin Hotels, Inc., and GAB Business Services, Inc. Airline operations account for about 85 percent of consolidated assets and about 88 percent of consolidated revenues, over the 1978-1980 period. Operating income showed wide variation over the period, due to significant losses in the airline segment in 1979 and 1980. In 1980, airline operating losses were nearly four times greater than

consolidated operating income; earnings from the hotel segment (\$72.6 million) were able to offset airline losses (\$65.6 million). The critical airline loss (\$235.4 million) occurring in 1979 when United was severely affected by a strike and the grounding of DC-10s was only tempered by earnings in the other segments (\$74.6 million). A consolidated level loss of over \$160 million was reported in 1979. The following table shows the distribution between segments of operating revenues, income and identifiable assets.

Table 1

UAL, Inc.  
Line of Business Report

	<u>1978</u>	<u>1979</u>	<u>1980</u>
<b>REVENUES</b>			
Airlines	88.4%	86.0%	88.5%
Hotels	8.2%	10.0%	8.5%
Business Services	3.4%	4.0%	3.0%
<b>OPERATING INCOME</b>			
Airlines	83.5%	nm <sup>1</sup>	nm <sup>2</sup>
Hotels	13.6%	nm <sup>1</sup>	405.3%
Business Services	2.9%	nm <sup>1</sup>	60.7
<b>ASSETS</b>			
Airlines	85.0%	85.0%	84.2%
Hotels	11.3%	12.8%	13.7%
Business Services	2.2%	2.5%	2.4%

nm = not meaningful

<sup>1</sup> Airline net loss of \$235.4 million on consolidated net loss of \$160.8 million; hotels had operating income of \$63.8 million and business services, \$10.8 million.

<sup>2</sup> Airline net loss of \$65.6 million.

<sup>3</sup> Totals may not add due to nontraceable items and intercompany eliminations.

Like many other airlines, UAL's operating ratio does not preclude a loss: operating expenses have historically been managed to provide an operating profit. The 1981 operating ratio of 95 per cent is the highest since 1969 with the exception of 1979, the year United was shut down by a 58 day strike and reduced its operations for 38 days due to the grounding of the DC-10s.

Looking further, UAL showed a 1981 loss more than one and three quarters times its asset base, nearly the size of the loss recorded in 1979. In 1980, UAL's return on assets was about 50 per cent and in 1979, more than 800 per cent. Variations in earlier in earlier years did not approach the wide savings 1979 - 1981. Despite UAL's diversification, it performed worse than the industry relative to ROA in 1981 and 1979.

Despite its losses, funds from operations provided about one-third of total sources, doing better than the industry composite in 1981 and 1980. This can largely be accounted for by depreciation and new debt in the form of capitalized leases obligations. Again, the devastating effects of 1979 brought UAL far below the industry in that year.

UAL made property and equipment acquisitions far above its earnings ability in 1981 and 1979. Its acquisitions in other years were more conservative relative to funds provided from operations. Although the liquidity position of the corporation was on the decline after 1978. Asset replacement rates have tended to fall below that for the industry.

Debt to equity ratios rose steadily over the 1979 - 1981 period reversing an improving trend of the three previous years. By year end 1981, total debt was more than two and one half times equity, compared to the industry's three times. Of the Majors, only Northwest, Delta and US Air are in a better position. Further, UAL's long term portion of this 72 per cent debt is 35 per

cent, an historical low for the corporation, reflecting the increasing use of (short-term) commercial paper.

The decline in liquidity is reflected in diminishing ability of earnings before interest and taxes (EBIT) to cover interest. In 1981, this ratio was a -0.06, showing that there were no pre-tax and interest earnings; 1980 was somewhat better, showing almost a breakeven after interest (times interest earned ratio of 1.03) after a record low of -1.02 in 1979. The last time UAL's EBIT were insufficient to cover interest charges was 1975. The current ratio, assessing the corporation's ability to cover currently maturing obligations with current assets, shows a similar weakening in recent years after having established a position of relative strength in the past.

By year-end 1981, United had a fleet of 335 aircraft, including 21 DC-8s which were grounded or leased out to others. United had orders for 39 B-767s for delivery in 1982-1984 and options for 30 additional 767s. In March of 1982, United told Boeing to stop work on 20 of 39 aircraft on order.

# CONFIDENTIAL

## A STUDY FOR SYNERGY, INC.

MAY 21, 1982

THE FOLLOWING INFORMATION IS PROVIDED FOR THE 45 AIRLINES ON THE SPCS FILES  
AND THE S&P 400 AND S&P 500 COMPOSITES.

- 1) OPERATING RATIO- OPERATING EXPENSE DIVIDED BY OPERATING REVENUES
- 2) RETURN ON ASSETS (%) - NET INCOME DIVIDED BY TOTAL ASSETS
- 3) OPERATING FUNDS RATIO- NET INCOME PLUS DEPRECIATION PLUS DEFERRED TAXES  
(FROM THE SOURCE AND USE OF FUNDS STATEMENT) DIVIDED BY TOTAL SOURCES  
OF FUNDS
- 4) CAPITAL EXPENDITURES DIVIDED BY TOTAL ASSETS
- 5) CAPITAL EXPENDITURES DIVIDED BY OPERATING FUNDS (NET INCOME PLUS  
DEPRECIATION PLUS DEFERRED TAXES)
- 6) TOTAL DEBT DIVIDED BY TOTAL EQUITY- TOTAL ASSETS MINUS STOCKHOLDERS'  
EQUITY DIVIDED BY TOTAL STOCKHOLDERS' EQUITY
- 7) TOTAL DEBT DIVIDED BY TOTAL ASSETS
- 8) TOTAL NONCURRENT LIABILITIES DIVIDED BY TOTAL ASSETS- TOTAL ASSETS MINUS  
STOCKHOLDERS' EQUITY AND CURRENT LIABILITIES DIVIDED BY TOTAL ASSETS
- 9) TIMES INTEREST EARNED- PRETAX INCOME PLUS INTEREST EXPENSE DIVIDED BY  
INTEREST EXPENSE
- 10) CURRENT RATIO- CURRENT ASSETS DIVIDED BY CURRENT LIABILITIES
- 11) OPERATING FUNDS- NET INCOME PLUS DEPRECIATION PLUS DEFERRED TAXES  
(FROM THE SOURCE AND USE OF FUNDS STATEMENT)
- 12) CAPITAL EXPENDITURES
- 13) TOTAL SOURCES OF FUNDS

### AIRLINE STATISTICS

- 1) PASSENGER LOAD FACTOR- REVENUE PASSENGER MILES DIVIDED BY AVAILABLE SEAT  
MILES
- 2) REVENUE PASSENGER MILES
- 3) AVAILABLE SEAT MILES

NA- NOT AVAILABLE  
NR- NOT REPORTED

Source: Standard & Poors

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## OPERATING RATIO

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
1 AIR COMPASS INC	12	NA	0.89	NA	NA	NA	NA	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	1.00	0.92	0.97	1.51	1.09	1.11	1.20	NA	NA
3 AIR WISCONSIN INC	12	0.74	0.88	0.65	0.68	0.70	0.76	0.81	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	1.01	0.87	0.99	1.04	0.94	0.94	NA	NA
5 ALASKA AIRLINES INC	12	0.88	0.92	0.84	0.84	0.84	0.85	0.86	0.97	1.05
6 ALOMA AIRLINES INC	12	0.93	0.88	0.88	0.95	0.91	0.92	0.88	NA	NA
7 AMERICAN AIRLINES INC	12	0.93	0.96	0.89	0.92	0.91	0.95	0.98	0.94	0.89
8 AVIATION GROUP INC	06	0.93	NA	NA	NA	NA	NA	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	1.50	NA	NA	NA	NA	NA	NA	NA	NA
10 BRANTFORD AIRWAYS INC	12	1.02	1.03	0.98	0.86	0.87	0.86	0.84	NA	NA
11 BRANTFORD INTERNATIONAL CORP	12	1.08	1.01	0.97	0.84	0.87	0.86	0.84	0.83	0.85
12 CAPITOL AIR INC	12	0.92	0.95	0.98	0.92	0.93	0.95	0.99	0.90	0.90
13 COMAIR INC	09	NA	0.92	NA	NA	NA	NA	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	0.98	0.99	0.87	0.85	0.83	0.83	0.78	0.84	0.80
15 DELTA AIR LINES INC	06	0.89	0.90	0.82	0.82	0.83	0.84	0.79	0.80	0.79
16 EASTERN AIR LINES	12	0.95	0.94	0.89	0.93	0.90	0.94	0.89	0.95	0.89
17 EMPIRE AIRLINES INC	12	0.92	0.81	NA	NA	NA	NA	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	0.85	0.91	0.87	0.86	0.87	0.89	0.86	0.87	0.85
19 FRONTIER HOLDINGS INC	12	0.87	0.88	0.87	0.83	0.76	0.83	0.90	NA	NA
20 GREAT WESTERN AIRLINES INC	12	NA	0.80	1.02	0.83	0.76	0.83	0.90	NA	NA
21 HAWAIIAN AIRLINES INC	12	0.99	0.95	0.96	0.94	0.95	0.97	0.98	0.99	0.88
22 KLM ROYAL DUTCH AIRLINES	03	NA	0.94	0.94	0.87	0.87	0.95	0.96	0.95	0.95
23 METAC AIRLINES INC	04	NA	0.94	NA	NA	NA	NA	NA	NA	NA
24 MIDWAY AIRLINES INC	12	0.84	1.16	NA	NA	NA	NA	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	0.93	0.94	0.88	0.78	0.79	0.81	0.77	0.76	0.76
26 ORION AIRWAYS	09	NA	NA	1.05	1.05	0.96	1.02	0.95	NA	NA
27 PSA INC	12	0.87	0.95	0.86	0.88	0.87	0.87	0.87	0.89	0.86
28 PSA INC	12	0.83	0.91	0.82	0.87	0.87	0.87	0.87	0.82	0.76
29 PAN AMERICAN WORLD AIRWAYS	12	1.03	0.97	0.90	0.86	0.93	0.94	0.98	0.91	0.90
30 PETROLEUM HELICOPTERS INC	04	NA	0.87	NA	NA	NA	NA	NA	NA	NA
31 PIEDMONT AVIATION INC	12	0.86	0.88	0.88	0.88	0.88	0.89	0.83	0.83	0.82
32 REPUBLIC AIRLINES INC	12	0.94	0.94	0.91	0.83	0.86	0.89	0.83	0.85	0.84
33 ROCKY MOUNTAIN AIRWAYS INC	06	0.80	1.02	0.95	0.84	0.83	0.81	0.73	NA	NA
34 SOUTHWEST AIRLINES	12	0.76	0.71	0.72	0.84	0.83	0.69	0.65	0.64	0.63
35 STERLING OIL OF OKLAHOMA INC	12	NA	0.92	0.97	0.78	0.89	0.72	0.71	NA	NA
36 TACA INTERNATIONAL AIRLINES S A	12	NA	0.92	0.91	0.90	0.92	0.93	0.89	NA	NA
37 TEXAS AIR CORP	12	0.90	0.98	0.89	0.89	0.91	0.97	0.92	0.92	0.92
38 TIGER INTERNATIONAL	12	0.89	0.81	0.74	0.70	0.73	0.71	0.69	0.59	0.60
39 TRANS WORLD CORP	12	0.93	0.93	0.93	0.93	0.93	0.97	0.94	0.88	0.87
40 TWA INC	12	0.95	0.94	0.97	0.84	0.91	0.91	0.84	0.82	0.85
41 USAIR INC	12	0.81	0.86	0.88	0.88	0.91	0.94	0.98	0.88	0.88
42 WESTERN AIR LINES INC	12	1.20	0.99	0.93	0.88	0.92	0.94	0.84	0.81	0.84
43 WITS INC	12	0.97	0.96	0.97	0.98	1.03	1.05	0.97	NA	NA
44 WORLD AIRWAYS INC	12	NA	0.95	0.98	0.95	1.02	0.90	1.01	1.03	0.94
45 WRIGHT AIR LINES INC	12	NA	0.85	0.97	0.95	0.94	1.13	0.95	NA	NA

Source: Standard &amp; Poor's

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		OPERATING RATIO			
		1971	1970	1969	
1	AIR CHAMPAGNE INC	NA	NA	NA	12
2	AIR FLORIDA SYSTEM INC	NA	NA	NA	12
3	AIR WISCONSIN INC	NA	NA	NA	12
4	AIRLIFT INTERNATIONAL INC	NA	NA	NA	06
5	ALASKA AIRLINES INC	1.05	1.05	0.92	12
6	ALOMA AIRLINES INC	NA	NA	NA	12
7	AMERICAN AIRLINES INC	0.89	0.91	0.85	12
8	AVIATION GROUP INC	NA	NA	NA	06
9	BIG SLY TRANSPORTATION-CL A	NA	NA	NA	06
10	BRATTF AIRWAYS INC	NA	NA	NA	12
11	BRATTF INTERNATIONAL CORP	0.85	0.88	0.85	12
12	CAPITOL AIR INC	0.94	0.91	0.89	12
13	COMAIR INC	NA	NA	NA	03
14	CONTINENTAL AIR LINES INC	0.80	0.82	0.81	12
15	DELTA AIR LINES INC	0.80	0.74	0.73	06
16	EASTERN AIR LINES	0.89	0.87	0.88	12
17	EMPIRE AIRLINES INC	NA	NA	NA	12
18	FLIGHT TRANSPORTATION CORP	NA	NA	NA	06
19	FRONTIER HOLDINGS INC	0.92	0.93	0.92	12
20	GREAT WESTERN AIRLINES INC	NA	NA	NA	12
21	IMMATION AIRLINES INC	0.84	0.88	0.90	12
22	KLM ROYAL DUTCH AIRLINES	0.98	0.88	0.85	03
23	METRO AIRLINES INC	NA	NA	NA	04
24	MIDWAY AIRLINES INC	NA	NA	NA	12
25	NORTHWEST AIRLINES INC	0.78	0.68	0.69	12
26	OCEAN AIRWAYS	NA	NA	NA	03
27	OSAGE AIR LINES INC	0.83	0.90	0.93	12
28	PSA INC	0.70	0.67	0.69	12
29	PAN AMERICAN WORLD AIRWAYS	0.90	0.92	0.92	12
30	PETROLEUM HELICOPTERS INC	NA	NA	NA	04
31	PIEDMONT AVIATION INC	0.83	0.84	0.89	12
32	REPUBLIC AIRLINES INC	0.87	0.84	0.91	12
33	ROCKY MOUNTAIN AIRWAYS INC	NA	NA	NA	06
34	SOUTHWEST AIRLINES	1.50	NA	NA	12
35	STERLING OIL OF OKLAHOMA INC	NA	NA	NA	12
36	TACA INTERNATIONAL AIRPLS S A	NA	NA	NA	12
37	TEXAS AIR CORP	NA	NA	NA	12
38	TIGER INTERNATIONAL	0.63	0.76	0.76	12
39	TRANS WORLD CORP	0.93	0.98	0.89	12
40	UAL INC	0.87	0.90	0.82	12
41	USAIR INC	0.90	0.87	0.90	12
42	WESTERN AIR LINES INC	0.84	0.84	0.91	12
43	WITS INC	NA	NA	NA	12
44	WORLD AIRWAYS INC	0.81	0.84	0.79	12
45	WRIGHT AIR LINES INC	NA	NA	NA	12

Source: Standard & Poor's

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OPERATING RATIO

44 AIRLINE COMPOSITE  
47 SEP 500 COMPOSITE  
48 SEP 400 COMPOSITE

1981	1982	1979	1978	1977	1976	1975	1974	1973	1972
0.94	0.94	0.92	0.86	0.89	0.89	0.91	0.88	0.87	0.86
0.77	0.78	0.78	0.78	0.78	0.78	0.78	0.77	0.77	0.78
0.87	0.87	0.86	0.86	0.86	0.85	0.85	0.85	0.84	0.84

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OPERATING PATT

1971 1970 1969

44 AIRLINE COMPOSITE  
47 SEP 500 COMPOSITE  
48 SEP 400 COMPOSITE

0.87 0.88 0.85  
0.79 0.80 0.79  
0.85 0.85 0.84

Source: Standard & Poors

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## RETURN ON ASSETS (%)

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	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
1 AIR CHAPARRAL INC	12	NA	4.85	NA	NA	NA	NA	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	-1.46	3.76	4.78	-8.38	-25.60	-19.82	-25.29	NA	NA
3 AIR WISCONSIN INC	12	5.91	12.29	16.11	12.97	10.35	5.43	4.76	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	-21.49	1.26	-6.24	-25.14	-2.95	0.39	NA	NA
5 ALASKA AIRLINES INC	12	5.44	5.44	4.27	7.82	6.94	4.93	3.92	0.93	-11.11
6 ALOMA AIRLINES INC	12	2.77	6.02	1.86	6.53	2.37	2.79	5.90	NA	NA
7 AMERICAN AIRLINES INC	12	0.49	-4.63	2.75	4.84	3.28	-1.28	1.25	-2.85	0.33
8 AVIATION GROUP INC	06	-9.97	NA	NA	NA	NA	NA	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	-2.42	-55.37	NA	NA	NA	NA	NA	NA	NA
10 BRANIFF AIRWAYS INC	12	-16.99	-11.84	-3.41	5.5C	4.08	4.13	5.68	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	-15.93	-11.87	-3.91	5.29	4.01	3.82	5.25	4.90	4.42
12 CAPITOL AIR INC	12	2.23	-9.71	-21.20	-10.94	9.52	5.43	-2.42	2.42	2.46
13 COMAIR INC	03	NA	11.11	NA	NA	NA	NA	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	-6.99	-2.84	-1.78	7.26	1.36	-1.33	1.14	0.02	1.57
15 DELTA AIR LINES INC	06	6.36	4.56	7.65	7.96	4.78	3.64	7.58	7.27	5.40
16 EASTERN AIR LINES	12	-2.24	-1.49	2.35	3.52	2.70	-3.85	0.56	-3.58	1.84
17 EMPIRE AIRLINES INC	12	3.00	3.63	NA	NA	NA	NA	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	6.70	8.07	NA	NA	NA	NA	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	8.19	5.64	7.37	7.76	7.99	6.35	9.25	7.08	7.44
20 GREAT WESTERN AIRLINES INC	12	NA	2.88	-11.83	0.91	10.37	0.45	-12.66	NA	NA
21 HAWAIIAN AIRLINES INC	12	3.04	8.35	0.75	-0.88	3.52	-1.16	6.71	4.90	2.75
22 KLM ROYAL DUTCH AIRLINES	03	NA	8.28	0.43	2.78	2.76	-0.71	-2.88	-2.34	-2.12
23 METRO AIRLINES INC	04	NA	9.86	NA	NA	NA	NA	NA	NA	NA
24 NIMWAY AIRLINES INC	12	9.95	-18.21	NA	NA	NA	NA	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	0.76	4.46	4.74	4.44	4.49	3.57	5.78	4.78	1.92
26 OCEAN AIRWAYS	05	NA	-187.86	-54.79	-2.65	9.74	-19.20	-7.16	NA	NA
27 OZARK AIR LINES INC	12	7.48	-8.13	-0.40	4.76	6.51	0.53	5.03	-0.23	3.22
28 PSA INC	12	4.75	3.21	6.79	4.21	2.35	-5.05	0.78	0.33	2.76
29 PAN AMERICAN WORLD AIRWAYS	12	-8.76	2.39	2.84	5.80	-0.58	-3.14	-4.99	-1.09	-1.64
30 PETROLEUM HELICOPTERS INC	04	NA	4.64	NA	NA	NA	NA	NA	NA	NA
31 PIEDMONT AVIATION INC	12	6.48	4.22	3.80	2.80	3.35	0.16	5.05	2.58	1.94
32 REPUBLIC AIRLINES INC	12	-4.26	-2.38	2.38	7.32	4.19	3.89	6.91	5.60	6.36
33 ROCKY MOUNTAIN AIRWAYS INC	06	-3.18	16.82	-0.21	0.07	3.35	3.38	7.50	NA	NA
34 SOUTHWEST AIRLINES	12	11.71	12.67	9.65	13.71	11.30	9.13	5.63	0.38	-14.13
35 STERLING OIL OF OKLAHOMA INC	12	NA	5.01	-2.64	0.62	8.12	9.90	13.98	NA	NA
36 TACA INTERNATIONAL AIRLINES S A	12	NA	4.28	-4.31	6.25	0.61	-0.18	3.97	NA	NA
37 TEANA AIR CORP	12	-3.82	1.81	12.97	4.09	3.87	-8.01	0.62	0.48	-1.84
38 TIGER INTERNATIONAL	12	-0.01	1.54	2.22	3.06	1.73	1.44	1.35	3.84	4.16
39 TRANS WORLD CORP	12	1.24	0.64	0.31	3.53	1.94	-4.67	-1.17	2.42	2.69
40 UAL INC	12	-1.77	0.52	-1.69	8.18	0.64	-0.20	3.84	2.12	0.87
41 USAIP INC	12	-5.83	0.45	6.27	5.56	1.52	-3.22	1.57	1.92	1.67
42 WESTERN AIR LINES INC	12	-8.80	-3.23	5.04	5.88	3.47	1.23	6.07	5.40	3.27
43 WTS INC	12	8.01	3.76	2.56	-0.33	-18.17	-16.25	6.18	NA	NA
44 WORLD AIRWAYS INC	12	NA	-5.19	2.35	0.64	0.09	4.19	2.88	0.53	2.46
45 WRIGHT AIR LINES INC	12	NA	11.03	-4.82	-11.29	-0.35	-34.27	-12.74	NA	NA

Source: Standard &amp; Poor's

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## RETURN ON ASSETS (%)

		1971	1970	1969
1 AIR CHAMPARRAL INC	12	NA	NA	NA
2 AIR FLOPIDA SYSTEM INC	12	NA	NA	NA
3 AIR WISCONSIN INC	12	NA	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	NA	1.08
5 ALASKA AIRLINES INC	12	-16.29	-23.49	
6 ALOMA AIRLINES INC	12	NA	NA	NA
7 AMERICAN AIRLINES INC	12	0.16	-1.73	2.58
8 AVIATION GROUP INC	06	NA	NA	NA
9 B16 SKY TRANSPORTATION-CL A	06	NA	NA	NA
10 BRANIFF AIRWAYS INC	12	NA	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	2.78	-0.72	1.05
12 CAPITOL AIR INC	12	-6.58	-3.83	-0.21
13 COMAIR INC	03	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	1.47	0.73	0.80
15 DELTA AIR LINES INC	06	4.03	0.43	6.18
16 EASTERN AIR LINES	12	0.23	0.48	-0.23
17 EMURE AIRLINES INC	12	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	-12.51	-12.51	-12.51
20 GREAT WESTERN AIRLINES INC	12	NA	NA	NA
21 HAWAIIAN AIRLINES INC	12	0.91	-2.37	-4.79
22 KLM ROYAL DUTCH AIRLINES	03	-4.69	2.60	4.96
23 METRO AIRLINES INC	04	NA	NA	NA
24 MIDWAY AIRLINES INC	12	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	2.26	4.81	6.93
26 OCEAN AIRWAYS	05	NA	NA	NA
27 OZARK AIR LINES INC	12	9.38	-2.98	-4.98
28 PSA INC	12	2.63	2.37	1.93
29 PAN AMERICAN WORLD AIRWAYS	12	-2.49	-2.61	-1.59
30 PETROLEUM HELICOPTERS INC	04	NA	NA	NA
31 PIEDMONT AVIATION INC	12	0.20	-1.62	-1.48
32 REPUBLIC AIRLINES INC	12	1.30	2.70	-2.61
33 ROCKY MOUNTAIN AIRWAYS INC	06	NA	NA	NA
34 SOUTHWEST AIRLINES	12	-12.29	NA	NA
35 STELLING OIL OF OKLAHOMA INC	12	NA	NA	NA
36 TACA INTERNATIONAL AIRLINES S A	12	NA	NA	NA
37 TEXAS AIR CORP	12	NA	NA	NA
38 TIGER INTERNATIONAL	12	3.10	4.97	2.18
39 TRANS WORLD CORP	12	0.23	-4.52	1.40
40 UAL INC	12	-0.23	-1.88	2.30
41 USAIP INC	12	-0.94	0.17	-3.35
42 WESTERN AIR LINES INC	12	1.73	0.17	-3.32
43 WITS INC	12	NA	NA	NA
44 WORLD AIRWAYS INC	12	3.70	1.69	4.42
45 WRIGHT AIR LINES INC	12	NA	NA	NA

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Source: Standard &amp; Poors

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RETURN ON ASSETS (%)

44 AIRLINE COMPOSITE  
47 SEP 500 COMPOSITE  
48 SEP 400 COMPOSITE

1981	1982	1979	1978	1977	1976	1975	1974	1973	1972
-1.56	-0.37	1.81	5.25	4.04	2.44	-0.37	1.75	1.14	1.41
4.09	4.25	4.65	4.36	4.27	4.29	3.79	4.23	4.43	4.00
6.31	6.59	7.36	6.72	6.62	6.71	5.90	6.78	7.02	6.02

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Source: Standard & Poors

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RETURN ON ASSETS (%)			
	1971	1970	1969
46 AIRLINE COMPOSITE	0.23	-0.50	1.48
47 SEP 500 COMPOSITE	3.91	3.85	4.52
48 SEP 400 COMPOSITE	5.66	5.45	6.40

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46 AIRLINE COMPOSITE  
47 SEP 500 COMPOSITE  
48 SEP 400 COMPOSITE

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## OPERATING FUNDS RATIO

	1981	1980	1979	1976	1977	1974	1975	1974	1973	1972
1 AIR CAMPBELL INC	12	MA	0.23	MA	MA	MA	MA	MA	MA	MA
2 AIR FLORIDA SYSTEM INC	12	0.05	0.08	0.11	0.03	-7.54	-2.67	-0.77	MA	MA
3 AIR WISCONSIN INC	12	0.38	0.36	0.94	0.94	0.77	0.85	0.22	MA	MA
4 AIRLIFT INTERNATIONAL INC	04	MA	-0.10	0.43	-0.33	MA	1.28	1.52	MA	MA
5 ALASKA AIRLINES INC	12	0.22	0.25	0.50	0.36	0.34	0.20	0.17	0.20	-0.13
6 ALOMA AIRLINES INC	12	0.37	0.42	0.26	0.59	0.37	0.37	0.58	MA	MA
7 AMERICAN AIRLINES INC	12	3.37	0.12	0.45	0.69	0.42	0.42	0.65	0.53	0.46
8 AVIATION GROUP INC	06	-0.08	MA	MA	MA	MA	MA	MA	MA	MA
9 BIG SKY TRANSPORTATION-CL A	06	0.10	MA	MA	MA	MA	MA	MA	MA	MA
10 BRANIFF AIRWAYS INC	12	-6.21	-0.16	0.01	0.35	0.31	0.55	0.55	MA	MA
11 BRANIFF INTERNATIONAL CORP	12	-3.92	-0.17	0.00	0.34	0.30	0.52	0.54	0.28	0.41
12 CAPITOL AIR INC	12	0.33	0.42	-1.12	0.54	0.91	0.44	0.48	0.92	0.32
13 COMAIR INC	03	MA	0.96	MA	MA	MA	MA	MA	MA	MA
14 CONTINENTAL AIR LINES INC	12	0.00	0.08	0.17	0.86	0.87	0.22	0.37	0.24	0.22
15 DELTA AIR LINES INC	06	0.84	0.76	0.93	0.92	0.84	0.61	0.50	0.87	0.94
16 EASTERN AIR LINES	12	0.26	0.18	0.33	0.43	0.52	0.32	0.51	0.64	0.26
17 EMPIRE AIRLINES INC	12	0.16	0.28	MA	MA	MA	MA	MA	MA	MA
18 FLIGHT TRANSPORTATION CORP	06	CF	CF	MA	MA	MA	MA	MA	MA	MA
19 FRONTIER HOLDINGS INC	12	0.61	0.59	0.38	0.47	0.93	0.86	0.56	0.63	0.36
20 GREAT WESTERN AIRLINES INC	12	MA	0.78	-0.01	0.17	0.77	0.54	0.15	MA	MA
21 HAWAIIAN AIRLINES INC	12	0.69	0.13	0.18	0.17	0.15	0.08	1.00	0.40	0.69
22 KLM ROYAL DUTCH AIRLINES	03	MA	0.31	0.21	0.47	0.48	0.17	0.37	0.30	MA
23 METRO AIRLINES INC	04	0.43	MA	MA	MA	MA	MA	MA	MA	MA
24 MIDWAY AIRLINES INC	12	0.19	-0.18	MA	MA	MA	MA	MA	MA	MA
25 NORTHWEST AIRLINES INC	12	0.96	0.99	0.99	0.94	0.97	0.77	0.86	0.57	0.40
26 OCEAN AIRWAYS	05	MA	MA	-0.84	-0.71	0.22	MA	0.72	MA	MA
27 OZARK AIR LINES INC	12	0.55	0.34	0.17	0.51	0.74	0.51	0.36	0.76	0.72
28 PSA INC	12	CF	CF	CF	CF	0.80	0.03	0.27	0.36	0.55
29 PAN AMERICAN WORLD AIRWAYS	12	-0.03	0.37	0.55	0.48	0.43	0.54	-0.35	0.40	0.59
30 PETROLEUM HELICOPTERS INC	04	MA	0.17	MA	MA	MA	MA	MA	MA	MA
31 PIEDMONT AVIATION INC	12	0.41	0.34	0.24	0.44	0.71	0.78	0.65	0.80	0.43
32 REPUBLIC AIRLINES INC	12	CF	CF	0.16	0.36	0.28	0.26	0.94	0.41	0.76
33 ROCKY MOUNTAIN AIRWAYS INC	04	0.20	0.46	0.16	0.08	0.90	0.20	0.24	MA	MA
34 SOUTHWEST AIRLINES	12	0.49	0.52	0.33	0.67	0.31	0.43	0.35	0.91	-0.08
35 STERLING OIL OF OKLAHOMA INC	12	MA	0.76	0.13	0.11	0.68	0.33	0.77	MA	MA
36 TACA INTERNATIONAL AIRLINES S A	12	MA	0.74	0.97	0.15	0.31	0.69	0.93	MA	MA
37 TEXAS AIR CORP	12	-0.03	0.28	0.23	0.15	0.46	0.09	0.66	0.80	0.15
38 TIGER INTERNATIONAL	12	0.23	0.19	0.24	0.35	0.24	0.30	0.19	0.30	0.45
39 TRANS WORLD CORP	12	0.38	0.34	0.35	0.67	0.48	0.26	0.26	0.36	0.50
40 UAL INC	12	0.32	0.38	0.15	0.73	0.50	0.65	0.69	0.87	0.73
41 USRIR INC	12	0.38	0.36	0.42	0.35	0.27	0.12	0.36	0.75	0.16
42 WESTERN AIR LINES INC	12	-0.29	0.04	0.40	0.50	0.42	0.59	0.72	0.65	0.94
43 WITS INC	12	0.58	0.45	0.57	0.15	-0.39	-14.38	0.41	MA	MA
44 WORLD AIRWAYS INC	12	MA	-0.06	0.18	0.12	0.51	0.95	0.17	0.09	0.85
45 WRIGHT AIR LINES INC	12	MA	0.40	0.06	-0.91	0.29	-11.09	-0.25	MA	MA

Source: Standard &amp; Poor's

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		OPERATING FUNDS RATIO		
		1971	1970	1969
1	AIR CHAMPARAL INC	12	NA	NA
2	AIR FLORIDA SYSTEM INC	12	NA	NA
3	AIR WISCONSIN INC	12	NA	NA
4	AIRLIFT INTERNATIONAL INC	06	NA	NA
5	ALASKA AIRLINES INC	12	-0.15	NA
6	ALOMA AIRLINES INC	12	NA	NA
7	AMERICAN AIRLINES INC	12	0.21	NA
8	AVIATION GROUP INC	06	NA	NA
9	BIG SKY TRANSPORTATION-CL A	04	NA	NA
10	BRANIFF AIRWAYS INC	12	NA	NA
11	BRANIFF INTERNATIONAL CORP	12	0.24	NA
12	CAPITOL AIR INC	12	1.28	NA
13	CONAIR INC	03	NA	NA
14	CONTINENTAL AIR LINES INC	12	0.60	NA
15	DELTA AIR LINES INC	06	0.86	NA
16	EASTERN AIR LINES	12	0.26	NA
17	EMPIRE AIRLINES INC	12	NA	NA
18	FLIGHT TRANSPORTATION CORP	04	NA	NA
19	FRONTIER HOLDINGS INC	12	0.47	NA
20	GREAT WESTERN AIRLINES INC	12	NA	NA
21	HAWAIIAN AIRLINES INC	12	0.79	NA
22	KLM ROYAL DUTCH AIRLINES	03	NR	NA
23	METRO AIRLINES INC	04	NA	NA
24	MIDWAY AIRLINES INC	12	NA	NA
25	NORTHWEST AIRLINES INC	12	0.86	NA
26	OCEAN AIRWAYS	05	NA	NA
27	OZARK AIR LINES INC	12	0.67	NA
28	PSA INC	12	0.41	NA
29	PAN AMERICAN WORLD AIRWAYS	12	0.20	NA
30	PETROLEUM HELICOPTERS INC	04	NA	NA
31	PIEDMONT AVIATION INC	12	0.72	NA
32	REPUBLIC AIRLINES INC	12	0.35	NA
33	ROCKY MOUNTAIN AIRWAYS INC	06	NA	NA
34	SOUTHWEST AIRLINES	12	-0.07	NA
35	STERLING OIL OF OKLAHOMA INC	12	NA	NA
36	TACA INTERNATIONAL AIRPLS S A	12	NA	NA
37	TEXAS AIR CORP	12	NA	NA
38	TIGER INTERNATIONAL	12	0.48	NA
39	TRANS WORLD CORP	12	0.33	NA
40	UAL INC	12	0.55	NA
41	USAIP INC	12	0.34	NA
42	WESTERN AIR LINES INC	12	0.91	NA
43	WITS INC	12	NA	NA
44	WORLD AIRWAYS INC	12	0.33	NA
45	WRIGHT AIR LINES INC	12	NA	NA

Source: Standard & Poor's

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OPERATING FUNDS RATIO

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	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
46 AIRLINE COMPOSITE	0.26	0.25	0.31	0.52	0.55	0.53	0.41	0.49	0.42	0.44
47 SEP 500 COMPOSITE	0.63	0.67	0.70	0.71	0.70	0.70	0.69	0.71	0.77	0.68
48 SEP 400 COMPOSITE	0.61	0.66	0.70	0.71	0.71	0.70	0.66	0.66	0.73	0.69

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46 AIRLINE COMPOSITE  
47 SEP 500 COMPOSITE  
48 SEP 400 COMPOSITE

OPERATING FUNDS RATIO

1971	1970	1969
0.36	MM	MM
0.65	MM	MM
0.67	MM	MM

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CA: Source: Standard & Poors  
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## CAPITAL EXPENDITURES/TOTAL ASSETS

		1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
1 AIR CHAPARRAL INC	12	NA	0.34	NA	NA	NA	NA	NA	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	0.47	0.53	0.24	0.83	0.07	0.08	0.09	0.17	NA	NA
3 AIR WISCONSIN INC	12	0.43	0.54	0.29	0.20	0.13	0.26	0.15	0.53	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	0.26	0.33	0.44	0.16	0.03	0.04	0.08	NA	NA
5 ALASKA AIRLINES INC	12	0.37	0.37	0.16	0.22	0.20	0.16	0.38	0.38	0.09	0.17
6 ALOMA AIRLINES INC	12	0.21	0.19	0.36	0.14	0.43	0.16	0.13	0.04	NA	NA
7 AMERICAN AIRLINES INC	12	0.15	0.13	0.11	0.11	0.12	0.04	0.03	0.04	0.03	0.18
8 AVIATION GROUP INC	06	0.21	NA	NA	NA	NA	NA	NA	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	0.41	0.51	NA	NA	NA	NA	NA	NA	NA	NA
10 BRARIFF AIRWAYS INC	12	0.00	0.19	0.29	0.22	0.14	0.16	0.13	0.11	NA	NA
11 BRIGGIE INTERNATIONAL CORP	12	0.01	0.21	0.28	0.21	0.13	0.16	0.13	0.11	0.30	0.20
12 CAPITOL AIR INC	12	0.41	0.21	0.42	0.16	0.05	0.09	0.46	0.00	0.01	0.01
13 COMAIR INC	03	NA	0.11	NA	NA	NA	NA	NA	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	0.16	0.27	0.06	0.09	0.04	0.03	0.19	0.19	0.21	0.24
15 DELTA AIR LINES INC	06	0.20	0.17	0.20	0.12	0.16	0.15	0.26	0.38	0.14	0.08
16 EASTERN AIR LINES	12	0.20	0.20	0.16	0.21	0.08	0.07	0.07	0.05	0.22	0.26
17 EMPIRE AIRLINES INC	12	0.12	0.24	NA	NA	NA	NA	NA	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	0.71	0.59	NA	NA	NA	NA	NA	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	0.13	0.16	0.28	0.44	0.09	0.15	0.14	0.10	0.09	0.22
20 GREAT WESTERN AIRLINES INC	12	NA	0.03	0.18	0.51	0.19	0.13	0.37	0.61	NA	NA
21 HAWAIIAN AIRLINES INC	12	0.48	0.19	0.22	0.31	0.11	0.58	0.15	0.89	0.09	0.03
22 KLM ROYAL DUTCH AIRLINES	03	NA	0.12	0.18	0.09	0.14	0.02	0.08	0.08	0.10	0.16
23 METRO AIRLINES INC	04	NA	0.35	NA	NA	NA	NA	NA	NA	NA	NA
24 MIDWAY AIRLINES INC	12	CP	0.42	NA	NA	NA	NA	NA	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	0.03	0.14	0.22	0.14	0.15	0.10	0.17	0.16	0.26	0.13
26 OCEAN AIRWAYS	05	NA	0.08	0.42	0.42	0.00	0.03	0.06	0.05	NA	NA
27 OZARK AIR LINES INC	12	0.11	0.12	0.62	0.12	0.25	0.04	0.18	0.21	0.07	0.12
28 PSA INC	12	0.35	0.17	0.26	0.16	0.17	0.02	0.03	0.16	0.09	0.02
29 PAN AMERICAN WORLD AIRWAYS	12	0.13	0.16	0.12	0.10	0.11	0.04	0.05	0.05	0.06	0.08
30 PETROLEUM HELICOPTERS INC	04	NA	0.18	NA	NA	NA	NA	NA	NA	NA	NA
31 PIEDMONT AVIATION INC	12	0.32	0.20	0.27	0.28	0.11	0.06	0.03	0.13	0.07	0.09
32 REPUBLIC AIRLINES INC	12	0.17	0.41	0.21	0.27	0.15	0.32	0.17	0.03	0.22	0.04
33 ROCKY MOUNTAIN AIRWAYS INC	06	0.13	0.02	0.34	0.64	0.06	0.07	0.29	0.46	NA	NA
34 SOUTHWEST AIRLINES	12	0.27	0.25	0.32	0.38	0.53	0.31	0.27	0.34	0.06	0.01
35 STERLING OIL OF OKLAHOMA INC	12	NA	0.03	0.15	0.15	0.08	0.04	0.08	0.00	NA	NA
36 TACA INTERNATIONAL AIRLINES S A	12	NA	0.02	0.03	0.47	0.05	0.21	0.02	0.02	NA	NA
37 TEXAS AIR CORP	12	0.61	0.10	0.24	0.13	0.25	0.16	0.16	0.13	0.04	0.24
38 TIGER INTERNATIONAL	12	0.08	0.20	0.18	0.13	0.14	0.07	0.09	0.19	0.12	0.10
39 TRANS WORLD CORP	12	0.12	0.16	0.13	0.08	0.05	0.05	0.12	0.13	0.12	0.10
40 UAL INC	12	0.11	0.11	0.14	0.16	0.08	0.03	0.09	0.10	0.05	0.14
41 USAIR INC	12	0.25	0.16	0.14	0.17	0.05	0.07	0.15	0.12	0.03	0.42
42 WESTERN AIR LINES INC	12	0.06	0.19	0.23	0.23	0.16	0.10	0.10	0.23	0.20	0.17
43 WITS INC	12	0.15	0.10	0.06	0.03	0.01	0.01	0.03	0.04	NA	NA
44 WORLD AIRWAYS INC	12	NA	0.24	0.26	0.32	0.03	0.03	0.00	0.17	0.04	0.00
45 WRIGHT AIR LINES INC	12	NA	0.17	0.20	0.20	0.31	0.47	0.16	0.27	NA	NA

Source: Standard &amp; Poor's

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## CAPITAL EXPENDITURES/TOTAL ASSETS

		1971	1970	1969
1 AIR CHAPARRAL INC	12	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	NA	NA	NA
3 AIR WISCONSIN INC	12	NA	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	NA	NA
5 ALASKA AIRLINES INC	12	0.10	0.14	0.09
6 ALOMA AIRLINES INC	12	NA	NA	NA
7 AMERICAN AIRLINES INC	12	0.19	0.12	0.08
8 AVIATION GROUP INC	06	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	NA	NA	NA
10 BRANIFF AIRWAYS INC	12	NA	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	0.05	0.03	0.03
12 CAPITOL AIR INC	12	0.01	0.01	0.28
13 COMAIR INC	03	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	0.06	0.22	0.06
15 DELTA AIR LINES INC	06	0.17	0.14	0.33
16 EASTERN AIR LINES	12	0.08	0.19	0.14
17 EMPIRE AIRLINES INC	12	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	0.02	0.03	0.20
20 GREAT WESTERN AIRLINES INC	12	NA	NA	NA
21 HAWAIIAN AIRLINES INC	12	0.02	0.03	0.30
22 KLM ROYAL DUTCH AIRLINES	03	0.18	0.22	0.32
23 METRO AIRLINES INC	04	NA	NA	NA
24 MIDWAY AIRLINES INC	12	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	0.14	0.25	0.26
26 OCEAN AIRWAYS	05	NA	NA	NA
27 OZARK AIR LINES INC	12	0.01	0.08	0.16
28 PSA INC	12	0.06	0.12	0.33
29 PAN AMERICAN WORLD AIRWAYS	12	0.07	0.21	0.11
30 PETROLEUM HELICOPTERS INC	04	NA	NA	NA
31 PIEDMONT AVIATION INC	12	0.02	0.06	0.37
32 REPUBLIC AIRLINES INC	12	0.02	0.10	0.14
33 ROCKY MOUNTAIN AIRWAYS INC	06	NA	NA	NA
34 SOUTHWEST AIRLINES	12	0.86	NA	NA
35 STERLING OIL OF OKLAHOMA INC	12	NA	NA	NA
36 TACA INTERNATIONAL AIRLS S A	12	NA	NA	NA
37 TEXAS AIR CORP	12	NA	NA	NA
38 TIGER INTERNATIONAL	12	0.87	0.06	0.13
39 TRANS WORLD CORP	12	0.09	0.17	0.14
40 UAL INC	12	0.07	0.12	0.14
41 USAIR INC	12	0.04	0.11	0.28
42 WESTERN AIR LINES INC	12	0.01	0.01	0.16
43 WITS INC	12	NA	NA	NA
44 WORLD AIRWAYS INC	12	0.18	0.01	0.01
45 WRIGHT AIR LINES INC	12	NA	NA	NA

Source: Standard &amp; Poors

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CAPITAL EXPENDITURES/TOTAL ASSETS

46 AIRLINE COMPOSITE  
47 SEP 500 COMPOSITE  
48 SEP 400 COMPOSITE

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
46 AIRLINE COMPOSITE	0.16	0.17	0.18	0.15	0.11	0.07	0.11	0.13	0.12	0.15
47 SEP 500 COMPOSITE	0.08	0.08	0.07	0.06	0.06	0.06	0.06	0.07	0.06	0.06
48 SEP 400 COMPOSITE	0.12	0.12	0.12	0.10	0.10	0.10	0.10	0.11	0.09	0.09

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CAPITAL EXPENDITURES/TOTAL ASSETS

	1971	1970	1969
44 AIRLINE COMPOSITE	0.14	0.15	0.15
47 S&P 500 COMPOSITE	0.07	0.08	0.08
48 S&P 400 COMPOSITE	0.09	0.10	0.10

Source: Standard & Poors

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## CAPITAL EXPEN/OPERATING FUNDS

		1981	1980	1979	1976	1977	1976	1975	1974	1973	1972
1 AIR CHAPARRAL INC	12	NA	2.99	NA	NA	NA	NA	NA	NA	NA	NA
2 AIR FLORIDA SYSTEM I-C	12	14.73	7.62	3.04	34.58	NA	NA	NA	NA	NA	NA
3 AIR WISCONSIN INC	12	2.30	2.7	1.20	0.73	0.53	1.12	0.94	3.90	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	NA	1.64	2.66	NA	NA	0.37	0.72	NA	NA
5 ALASKA AIRLINES INC	12	2.60	2.94	1.19	1.31	1.26	1.09	3.40	3.70	1.33	NA
6 ALOMA AIRLINES INC	12	2.09	1.57	3.85	0.92	6.67	1.31	1.40	0.27	NA	NA
7 AMERICAN AIRLINES INC	12	2.09	6.56	1.39	1.01	1.20	0.42	0.57	0.40	0.67	2.57
8 AVIATION GROUP INC	06	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	5.44	NA	NA	NA	NA	NA	NA	NA	NA	NA
10 BRANIFF AIRWAYS INC	12	NA	NA	100.49	1.54	0.89	1.17	1.04	0.73	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	NA	NA	NA	1.54	0.91	1.17	1.10	0.74	2.49	1.71
12 CAPITOL AIR INC	12	2.37	1.85	NA	3.02	0.26	0.41	3.28	0.05	0.07	0.06
13 COMAIR INC	03	NA	0.47	NA	NA	NA	NA	NA	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	461.19	9.75	1.89	0.62	0.39	0.29	4.04	2.20	3.00	2.56
15 DELTA AIR LINES INC	06	1.16	1.11	1.04	0.63	0.79	0.87	1.66	1.94	0.77	0.47
16 EASTERN AIR LINES	12	3.33	3.46	1.66	1.71	0.73	0.59	1.59	0.59	10.73	2.94
17 EMPIRE AIRLINES INC	12	1.34	2.28	NA	NA	NA	NA	NA	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	CF	CF	NA	NA	NA	NA	NA	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	0.75	1.09	1.80	2.78	0.58	0.54	1.09	0.68	0.53	1.14
20 GREAT WESTERN AIRLINES INC	12	NA	0.22	NA	5.15	0.62	0.35	1.10	3.65	NA	NA
21 HAWAIIAN AIRLINES INC	12	6.09	5.01	3.53	6.90	2.09	6.00	3.59	0.21	0.37	0.27
22 KLM ROYAL DUTCH AIRLINES	03	NA	2.24	3.41	0.96	1.22	0.16	1.80	2.11	3.03	NA
23 METRO AIRLINES INC	04	NA	1.56	NA	NA	NA	NA	NA	NA	NA	NA
24 MIDWAY AIRLINES INC	12	CF	NA	NA	NA	NA	NA	NA	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	0.36	2.84	1.69	0.96	0.79	0.63	1.37	0.93	2.02	1.15
26 OCEAN AIRWAYS	05	NA	NA	NA	NA	NA	NA	NA	1.12	NA	NA
27 OZARK AIR LINES INC	12	0.63	1.37	7.08	0.76	1.30	0.22	1.26	1.36	0.68	0.85
28 PSA INC	12	CF	CF	CF	CF	1.50	0.12	3.59	1.92	1.38	0.21
29 PAN AMERICAN WORLD AIRWAYS	12	NA	1.70	1.33	0.71	1.10	0.61	1.04	NA	1.10	1.67
30 PETROLEUM HELICOPTERS INC	04	NA	1.83	NA	NA	NA	NA	NA	NA	NA	NA
31 PIEDMONT AVIATION INC	12	2.30	1.84	2.47	2.48	0.85	0.48	0.28	0.95	0.57	0.80
32 REPUBLIC AIRLINES INC	12	CF	CF	2.86	1.96	1.14	3.16	1.83	0.17	1.81	0.33
33 ROCKY MOUNTAIN AIRWAYS INC	06	2.99	0.07	3.50	9.91	NA	0.54	2.81	2.68	NA	NA
34 SOUTHWEST AIRLINES	12	1.33	1.18	1.91	1.48	3.50	1.75	1.45	2.15	0.51	NA
35 STERLING OIL OF OKLAHOMA INC	12	NA	0.29	2.71	4.57	0.43	0.32	0.58	0.00	NA	NA
36 TACA INTERNATIONAL AIRLS S A	12	NA	0.17	0.72	3.85	0.35	2.58	0.27	0.18	NA	NA
37 TEXAS AIR CORP	12	NA	1.63	1.39	2.51	1.97	1.18	12.70	1.27	0.49	4.03
38 TIGER INTERNATIONAL	12	1.81	3.18	2.32	1.31	1.86	1.07	1.40	3.30	1.20	0.90
39 TRANS WORLD CORP	12	1.39	2.01	1.57	0.69	0.44	0.51	14.83	3.34	1.25	1.25
40 UAL INC	12	2.80	1.50	4.89	1.03	0.77	0.43	1.24	0.65	0.43	1.50
41 USATR INC	12	1.92	1.02	0.99	0.95	0.39	0.51	5.85	1.45	0.28	5.68
42 WESTERN AIR LINES INC	12	NA	18.95	2.17	1.71	1.30	0.79	0.94	1.21	1.30	1.28
43 WITS INC	12	1.05	0.77	0.64	0.86	0.15	NA	NA	0.37	NA	NA
44 WOKLO AIRWAYS INC	12	NA	NA	3.88	6.06	1.02	1.04	0.02	2.71	1.46	0.07
45 WRIGHT AIR LINES INC	12	NA	0.80	3.33	NA	15.16	9.17	NA	NA	NA	NA

Source: Standard &amp; Poors

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## CAPITAL EXPEN/OPERATING FUNDS

		1971	1970	1969
1 AIR CHAPARRAL INC	12	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	NA	NA	NA
3 AIR WISCONSIN INC	12	NA	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	NA	NA
5 ALASKA AIRLINES INC	12	NM	NA	NA
6 ALOHA AIRLINES INC	12	NA	NA	NA
7 AMERICAN AIRLINES INC	12	2.85	NA	NA
8 AVIATION GROUP INC	06	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	NA	NA	NA
10 BRANIFF AIRWAYS INC	12	NA	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	0.50	NA	NA
12 CAPITOL AIR INC	12	0.73	NA	NA
13 COMAIR INC	03	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	0.65	NA	NA
15 DELTA AIR LINES INC	06	1.02	NA	NA
16 EASTERN AIR LINES	12	1.01	NA	NA
17 EMPIRE AIRLINES INC	12	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	0.50	NA	NA
20 GREAT WESTERN AIRLINES INC	12	NA	NA	NA
21 HAWAIIAN AIRLINES INC	12	0.17	NA	NA
22 KLM ROYAL DUTCH AIRLINES	03	NM	NA	NA
23 METRO AIRLINES INC	04	NA	NA	NA
24 MIDWAY AIRLINES INC	12	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	1.21	NA	NA
26 OCEAN AIRWAYS	05	NA	NA	NA
27 OZARK AIR LINES INC	12	0.08	NA	NA
28 PSA INC	12	0.61	NA	NA
29 PAM AMERICAN WORLD AIRWAYS	12	2.49	NA	NA
30 PETROLEUM HELICOPTERS INC	04	NA	NA	NA
31 PIEDMONT AVIATION INC	12	0.20	NA	NA
32 REPUBLIC AIRLINES INC	12	0.17	NA	NA
33 ROCKY MOUNTAIN AIRWAYS INC	06	NA	NA	NA
34 SOUTHWEST AIRLINES	12	NM	NA	NA
35 STERLING OIL OF OKLAHOMA INC	12	NA	NA	NA
36 TACA INTERNATIONAL AIRL S A	12	NA	NA	NA
37 TEXAS AIR CORP	12	NA	NA	NA
38 TIGER INTERNATIONAL	12	9.40	NA	NA
39 TRANS WORLD CORP	12	1.11	NA	NA
40 UAL INC	12	0.94	NA	NA
41 USAIR INC	12	0.70	NA	NA
42 WESTERN AIR LINES INC	12	0.07	NA	NA
43 WITS INC	12	NA	NA	NA
44 WORLD AIRWAYS INC	12	2.07	NA	NA
45 WRIGHT AIR LINES INC	12	NA	NA	NA

Source: Standard &amp; Poors

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CAPITAL EXPEN/OPERATING FUNDS

46 AIRLINE COMPOSITE  
47 SEP 500 COMPOSITE  
48 SEP 400 COMPOSITE

1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
2.94	2.80	2.16	1.14	0.93	0.68	1.58	1.31	1.37	1.67
0.98	0.99	0.94	0.86	0.85	0.82	0.91	0.97	0.84	C.93
0.96	0.95	0.90	0.81	0.81	0.79	0.87	0.89	0.76	0.76

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CAPITAL EXPEN/OPERATING FUNDS

	1971	1970	1969
46 AIRLINE COMPOSITE	1.84	NM	NM
47 SEP 500 COMPOSITE	1.01	NM	NM
48 SEP 400 COMPOSITE	0.82	NM	NM

46 AIRLINE COMPOSITE  
47 SEP 500 COMPOSITE  
48 SEP 400 COMPOSITE

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## TOTAL DEBT/TOTAL EQUITY

		1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
1 AIR CHAPARRAL INC	12	NA	16.51	NA	NA	NA	NA	NA	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	6.94	3.35	6.16	17.90	11.46	NA	NA	4.27	NA	NA
3 AIR WISCONSIN INC	12	1.89	1.10	1.19	0.86	1.23	1.60	1.94	2.30	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	NA	11.36	5.20	9.43	NA	4.28	4.50	NA	NA
5 ALASKA AIRLINES INC	12	2.19	4.30	4.59	2.57	2.32	2.84	5.52	11.41	NH	NH
6 ALOMA AIRLINES INC	12	3.74	3.75	4.30	3.36	3.24	2.23	2.19	2.16	NA	NA
7 AMERICAN AIRLINES INC	12	3.45	3.08	2.56	2.34	1.58	1.81	1.96	1.92	2.12	1.94
8 AVIATION GROUP INC	06	NH	NA	NA	NA	NA	NA	NA	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	27.29	4.25	2.86	2.04	1.58	2.00	2.17	2.18	NA	NA
10 BRANIFF AIRWAYS INC	12	NA	15.73	4.71	2.42	1.98	2.02	2.19	2.21	2.58	2.58
11 BRANIFF INTERNATIONAL CORP	12	NH	NH	16.55	1.96	1.69	1.20	2.02	2.03	2.27	2.72
12 CAPITOL AIR INC	12	NA	10.86	NA	NA	NA	NA	NA	NA	NA	NA
13 COMAIR INC	03	5.60	3.11	2.47	1.96	2.75	3.33	3.94	3.53	3.34	3.07
14 CONTINENTAL AIR LINES INC	12	1.21	1.22	1.10	1.24	1.40	1.71	1.81	1.69	1.49	1.46
15 DELTA AIR LINES INC	06	4.99	3.90	4.03	3.33	2.24	2.84	3.44	3.11	3.30	2.26
16 EASTERN AIR LINES	12	1.03	4.64	NA	NA	NA	NA	NA	NA	NA	NA
17 EMPIRE AIRLINES INC	12	1.07	0.69	NA	NA	NA	NA	NA	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	1.46	1.89	2.02	1.78	1.51	1.50	1.65	1.98	2.32	3.28
19 FRONTIER HOLDINGS INC	12	NA	15.28	71.74	5.93	2.93	7.84	NH	NH	NA	NA
20 GREAT WESTERN AIRLINES INC	12	11.71	7.62	6.47	5.92	4.49	4.20	2.53	2.04	1.89	2.69
21 HAWAIIAN AIRLINES INC	12	NA	2.71	2.33	1.82	2.06	2.59	2.75	3.36	2.94	2.53
22 KLM ROYAL DUTCH AIRLINES	03	NA	3.12	NA	NA	NA	NA	NA	NA	NA	NA
23 METRO AIRLINES INC	04	2.24	2.40	0.80	0.76	0.74	0.73	0.95	0.90	1.03	0.87
24 MIDWAY AIRLINES INC	12	0.79	0.83	NA	NA	NA	NA	NA	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	NA	1.57	NA	NH	6.27	1.89	6.65	1.97	NA	NA
26 OCEAN AIRWAYS	05	1.83	4.67	4.42	3.38	2.81	2.88	3.69	3.54	3.04	3.28
27 OZARK AIR LINES INC	12	2.41	3.19	2.25	1.98	1.49	1.32	1.53	1.63	1.54	1.48
28 PSA INC	12	2.77	3.18	2.69	2.16	4.26	3.10	4.73	4.35	3.34	3.29
29 PAN AMERICAN WORLD AIRWAYS	12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
30 PETROLEUM HELICOPTERS INC	04	NA	1.57	NA	NA	NA	NA	NA	NA	NA	NA
31 PIEDMONT AVIATION INC	12	2.28	2.84	3.97	4.10	4.54	4.48	5.61	6.02	8.66	11.58
32 REPUBLIC AIRLINES INC	12	14.96	7.81	2.78	2.38	2.10	2.12	1.65	1.52	1.83	1.93
33 ROCKY MOUNTAIN AIRWAYS INC	06	4.31	3.92	39.45	26.14	16.26	3.96	5.13	5.91	NA	NA
34 SOUTHWEST AIRLINES	12	0.65	1.10	1.95	1.77	1.93	1.26	2.20	3.56	6.01	7.23
35 STERLING OIL OF OKLAHOMA INC	12	NA	6.98	10.47	7.70	0.13	0.09	0.14	0.13	NA	NA
36 TACA INTERNATIONAL AIRPLS S A	12	NA	6.52	8.69	6.08	5.70	9.66	8.06	11.88	NA	NA
37 TEXAS AIR CORP	12	26.07	3.30	2.93	3.78	5.79	8.34	14.44	5.56	6.31	7.59
38 TIGER INTERNATIONAL	12	5.44	5.18	4.49	4.02	4.13	3.94	4.11	4.33	3.50	3.30
39 TRANS WORLD CORP	12	3.19	3.55	3.31	3.63	2.45	4.02	4.76	3.78	3.35	3.09
40 UAL INC	12	2.61	2.45	2.34	2.13	2.25	2.58	2.46	2.29	2.35	2.51
41 USAIR INC	12	1.49	1.63	1.47	1.41	2.68	3.39	4.53	3.44	3.57	4.16
42 WESTERN AIR LINES INC	12	5.86	3.65	2.53	2.55	2.00	2.68	2.05	1.99	2.32	2.54
43 WITS INC	12	40.74	NH	NH	NH	NH	NH	5.65	2.49	NA	NA
44 WORLD AIRWAYS INC	12	NA	5.14	3.09	3.31	0.67	0.64	0.70	0.87	1.46	2.01
45 WRIGHT AIR LINES INC	12	NA	NH	NH	NH	NH	NH	NH	NH	NA	NA

Source: Standard &amp; Poors

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## TOTAL DEBT/TOTAL EQUITY

		1971	1970	1969
1 AIR CHAMPARRAL INC	12	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	NA	NA	NA
3 AIR WISCONSIN INC	12	NA	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	NA	7.78
5 ALASKA AIRLINES INC	12	NM	NM	
6 ALOMA AIRLINES INC	12	NA	NA	NA
7 AMERICAN AIRLINES INC	12	1.88	3.23	2.70
8 AVIATION GROUP INC	06	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	NA	NA	NA
10 BRANIFF AIRWAYS INC	12	NA	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	2.82	3.49	3.30
12 CAPITOL AIR INC	12	4.24	3.63	3.53
13 COMAIR INC	03	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	3.79	4.23	3.15
15 DELTA AIR LINES INC	06	1.62	1.63	1.80
16 EASTERN AIR LINES	12	2.41	3.92	3.58
17 EMPIRE AIRLINES INC	12	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	7.78	6.78	10.15
20 GREAT WESTERN AIRLINES INC	12	NA	NA	NA
21 HAWAIIAN AIRLINES INC	12	3.73	4.32	4.08
22 KLM ROYAL DUTCH AIRLINES	03	1.99	2.08	1.65
23 METRO AIRLINES INC	04	NA	NA	NA
24 MIDWAY AIRLINES INC	12	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	0.98	0.98	0.74
26 OCEAN AIRWAYS	05	NA	NA	NA
27 OZARK AIR LINES INC	12	4.25	10.90	8.28
28 PSA INC	12	1.70	2.87	2.90
29 PAM AMERICAN WORLD AIRWAYS	12	3.12	3.36	2.51
30 PETROLEUM HELICOPTERS INC	04	NA	NA	NA
31 PIEDMONT AVIATION INC	12	19.16	23.41	13.17
32 REPUBLIC AIRLINES INC	12	2.47	4.80	4.84
33 ROCKY MOUNTAIN AIRWAYS INC	06	NA	NA	NA
34 SOUTHWEST AIRLINES	12	5.66	NA	NA
35 STERLING OIL OF OKLAHOMA INC	12	NA	NA	NA
36 TACA INTERNATIONAL AIRLS S A	12	NA	NA	NA
37 TEXAS AIR CORP	12	NA	NA	NA
38 TIGER INTERNATIONAL	12	3.89	2.92	3.61
39 TRANS WORLD CORP	12	3.06	3.68	2.93
40 UAL INC	12	2.46	2.83	2.31
41 USAIR INC	12	5.23	7.59	11.22
42 WESTERN AIR LINES INC	12	2.94	3.44	3.63
43 WITS INC	12	NA	NA	NA
44 WORLD AIRWAYS INC	12	2.14	1.96	2.45
45 WRIGHT AIR LINES INC	12	NA	NA	NA

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Source: Standard &amp; Poors

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TOTAL DEBT/TOTAL EQUITY

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
46 AIRLINE COMPOSITE	3.03	2.76	2.40	2.20	2.08	2.34	2.58	2.50	2.49	2.35
47 SEP 500 COMPOSITE	2.24	2.21	2.21	2.19	2.11	2.05	2.05	2.11	1.52	1.79
48 SEP 400 COMPOSITE	1.17	1.15	1.13	1.11	1.36	1.04	1.03	1.04	0.64	0.90

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TOTAL DEBT/TOTAL EQUITY

1971	1970	1969
2.40	2.87	2.50
1.67	1.59	1.50
0.88	0.87	0.81

46 AIRLINE COMPOSITE  
47 SEP 500 COMPOSITE  
48 SEP 400 COMPOSITE

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Source: Standard & Poors

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## TOTAL DEBT/TOTAL ASSETS

		1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
1 AIR CHAMPARAL INC	12	NA	0.94	NA	NA	NA	NA	NA	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	0.07	0.77	0.86	0.95	0.92	1.27	1.01	0.81	NA	NA
3 AIR WISCONSIN INC	12	0.65	0.52	0.54	0.46	0.55	0.62	0.66	0.70	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	1.12	0.92	0.84	0.90	1.05	0.81	0.82	NA	NA
5 ALASKA AIRLINES INC	12	0.69	0.81	0.82	0.72	0.70	0.74	0.85	0.92	1.04	1.06
6 ALOMA AIRLINES INC	12	0.79	0.79	0.81	0.77	0.76	0.69	0.69	0.68	NA	NA
7 AMERICAN AIRLINES INC	12	0.78	0.75	0.72	0.70	0.61	0.64	0.66	0.66	0.68	0.66
8 AVIATION GROUP INC	06	1.15	NA	NA	NA	NA	NA	NA	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	1.04	1.07	NA	NA	NA	NA	NA	NA	NA	NA
10 BRANIFF AIRWAYS INC	12	0.96	0.81	0.74	0.67	0.66	0.67	0.68	0.69	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	1.09	0.94	0.83	0.71	0.66	0.67	0.69	0.69	0.72	0.72
12 CAPITOL AIR INC	12	1.02	1.08	0.94	0.66	0.63	0.55	0.67	0.67	0.69	0.73
13 COMAIR INC	03	NA	0.92	NA	NA	NA	NA	NA	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	0.85	0.76	0.71	0.66	0.73	0.77	0.80	0.78	0.77	0.75
15 DELTA AIR LINES INC	06	0.55	0.55	0.52	0.55	0.58	0.63	0.64	0.63	0.60	0.59
16 EASTERN AIR LINES	12	0.83	0.80	0.80	0.77	0.69	0.74	0.78	0.76	0.77	0.69
17 EMPIRE AIRLINES INC	12	0.51	0.82	NA	NA	NA	NA	NA	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	0.52	0.41	NA	NA	NA	NA	NA	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	0.59	0.65	0.67	0.64	0.58	0.60	0.62	0.66	0.70	0.77
20 GREAT WESTERN AIRLINES INC	12	NA	0.94	0.99	0.86	0.75	0.89	1.00	1.13	NA	NA
21 HAWAIIAN AIRLINES INC	12	0.92	0.88	0.87	0.86	0.82	0.81	0.72	0.67	0.65	0.73
22 KLM ROYAL DUTCH AIRLINES	03	NA	0.73	0.70	0.65	0.67	0.72	0.73	0.77	0.75	0.72
23 METRO AIRLINES INC	04	NA	0.76	NA	NA	NA	NA	NA	NA	NA	NA
24 MIDWAY AIRLINES INC	12	0.69	0.71	NA	NA	NA	NA	NA	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	0.44	0.45	0.44	0.43	0.42	0.42	0.49	0.47	0.51	0.46
26 OCEAN AIRWAYS	05	NA	1.67	0.58	1.03	0.86	0.65	0.87	0.66	NA	NA
27 OZARK AIR LINES INC	12	0.65	0.82	0.82	0.75	0.74	0.74	0.79	0.78	0.75	0.77
28 PSA INC	12	0.71	0.76	0.69	0.66	0.60	0.57	0.61	0.62	0.61	0.60
29 PAN AMERICAN WORLD AIRWAYS	12	0.73	0.76	0.73	0.68	0.81	0.76	0.83	0.81	0.77	0.77
30 PETROLEUM HELICOPTERS INC	04	NA	0.61	NA	NA	NA	NA	NA	NA	NA	NA
31 PIEDMONT AVIATION INC	12	0.70	0.74	0.80	0.80	0.82	0.82	0.85	0.86	0.90	0.92
32 REPUBLIC AIRLINES INC	12	0.94	0.89	0.74	0.70	0.68	0.68	0.62	0.60	0.65	0.66
33 ROCKY MOUNTAIN AIRWAYS INC	06	0.81	0.80	0.98	0.96	0.94	0.80	0.84	0.86	NA	NA
34 SOUTHWEST AIRLINES	12	0.40	0.52	0.66	0.64	0.66	0.56	0.69	0.78	0.86	0.88
35 STERLING OIL OF OKLAHOMA INC	12	NA	0.87	0.91	0.89	0.82	0.08	0.12	0.11	NA	NA
36 TACA INTERNATIONAL AIRLINES S A	12	NA	0.87	0.90	0.86	0.85	0.91	0.89	0.92	NA	NA
37 TEXAS AIR CORP	12	0.96	0.77	0.75	0.79	0.85	0.89	0.94	0.85	0.86	0.88
38 TIGER INTERNATIONAL	12	0.84	0.84	0.82	0.80	0.81	0.80	0.80	0.81	0.78	0.77
39 TRANS WORLD CORP	12	0.76	0.78	0.77	0.77	0.71	0.80	0.83	0.79	0.77	0.76
40 UAL INC	12	0.72	0.71	0.71	0.68	0.69	0.72	0.71	0.70	0.70	0.72
41 USAIR INC	12	0.60	0.62	0.60	0.59	0.73	0.77	0.82	0.77	0.78	0.81
42 WESTERN AIR LINES INC	12	0.85	0.78	0.72	0.72	0.67	0.73	0.67	0.67	0.70	0.72
43 WITS INC	12	0.98	1.05	1.19	1.19	1.12	1.07	0.85	0.71	NA	NA
44 WORLD AIRWAYS INC	12	NA	0.84	0.76	0.77	0.40	0.39	0.41	0.46	0.59	0.67
45 WRIGHT AIR LINES INC	12	NA	1.28	1.59	1.67	1.62	1.95	2.22	2.10	NA	NA

Source: Standard &amp; Poors

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## TOTAL DEBT/TOTAL ASSETS

		1971	1972	1969
1 AIR CHAPARRAL INC	12	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	NA	NA	NA
3 AIR WISCONSIN INC	12	NA	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	NA	NA
5 ALASKA AIRLINES INC	12	1.13	1.31	0.89
6 ALOMA AIRLINES INC	12	NA	NA	NA
7 AMERICAN AIRLINES INC	12	0.65	0.76	0.73
8 AVIATION GROUP INC	06	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	NA	NA	NA
10 BRANIFF AIRWAYS INC	12	NA	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	0.74	0.78	0.77
12 CAPITOL AIR INC	12	0.81	0.78	0.78
13 COMAIR INC	03	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	0.79	0.81	0.76
15 DELTA AIR LINES INC	06	0.62	0.62	0.64
16 EASTERN AIR LINES	12	0.71	0.50	0.78
17 EMPIRE AIRLINES INC	12	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	0.89	0.87	0.91
20 GREAT WESTERN AIRLINES INC	12	NA	NA	NA
21 HAWAIIAN AIRLINES INC	12	0.79	0.81	0.80
22 KLM ROYAL DUTCH AIRLINES	03	0.67	0.68	0.62
23 METRO AIRLINES INC	04	NA	NA	NA
24 MIDWAY AIRLINES INC	12	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	0.49	0.50	0.43
26 OCEAN AIRWAYS	05	NA	NA	NA
27 OZARK AIR LINES INC	12	0.81	0.92	0.89
28 PSA INC	12	0.63	0.74	0.74
29 PAN AMERICAN WORLD AIRWAYS	12	0.76	0.77	0.72
30 PETROLEUM HELICOPTERS INC	04	NA	NA	NA
31 PIEDMONT AVIATION INC	12	0.95	0.96	0.93
32 REPUBLIC AIRLINES INC	12	0.11	0.83	0.83
33 ROCKY MOUNTAIN AIRWAYS INC	06	NA	NA	NA
34 SOUTHWEST AIRLINES	12	0.85	NA	NA
35 STERLING OIL OF OKLAHOMA INC	12	NA	NA	NA
36 TACA INTERNATIONAL AIRLS S A	12	NA	NA	NA
37 TEXAS AIR CORP	12	NA	NA	NA
38 TIGER INTERNATIONAL	12	0.80	0.74	0.78
39 TRANS WORLD CORP	12	0.75	0.79	0.75
40 UAL INC	12	0.71	0.74	0.70
41 USAIR INC	12	0.84	0.88	0.92
42 WESTERN AIR LINES INC	12	0.75	0.78	0.78
43 WITS INC	12	NA	NA	NA
44 WORLD AIRWAYS INC	12	0.68	0.66	0.71
45 WRIGHT AIR LINES INC	12	NA	NA	NA

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Source: Standard &amp; Poors

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TOTAL DEBT/TOTAL ASSETS

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
44 AIRLINE COMPOSITE	0.75	0.73	0.71	0.69	0.68	0.70	0.72	0.71	0.71	0.70
47 SEP 500 COMPOSITE	0.69	0.69	0.69	0.69	0.68	0.67	0.67	0.68	0.66	0.64
48 SEP 400 COMPOSITE	0.54	0.54	0.53	0.53	0.51	0.51	0.51	0.51	0.48	0.47

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TOTAL DEBT/TOTAL ASSETS

	1971	1970	1969
44 AIRLINE COMPOSITE	0.71	0.74	0.71
47 SEP 500 COMPOSITE	0.63	0.61	0.60
48 SEP 400 COMPOSITE	0.47	0.46	0.45

44 AIRLINE COMPOSITE  
47 SEP 500 COMPOSITE  
48 SEP 400 COMPOSITE

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## TTL NONCURRENT LIAB/TOTAL ASSETS

		1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
1 AIR CHAPARRAL INC	12	NA	0.68	NA	NA	NA	NA	NA	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	0.61	0.52	0.56	0.64	0.26	0.79	0.63	0.57	NA	NA
3 AIR WISCONSIN INC	12	0.54	0.39	0.43	0.25	0.32	0.41	0.47	0.49	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	0.68	0.66	0.63	0.43	0.55	0.45	0.40	NA	NA
5 ALASKA AIRLINES INC	12	0.39	0.49	0.47	0.46	0.43	0.49	0.56	0.53	0.43	0.38
6 ALOHA AIRLINES INC	12	0.51	0.46	0.51	0.44	0.49	0.33	0.29	0.28	NA	NA
7 AMERICAN AIRLINES INC	12	0.45	0.43	0.41	0.42	0.32	0.35	0.39	0.39	0.46	0.47
8 AVIATION GROUP INC	06	0.90	NA	NA	NA	NA	NA	NA	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	0.71	0.41	NA	NA	NA	NA	NA	NA	NA	NA
10 BRANIFF AIRWAYS INC	12	0.60	0.53	0.52	0.49	0.50	0.49	0.50	0.52	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	0.69	0.63	0.60	0.53	0.49	0.49	0.50	0.52	0.54	0.55
12 CAPITOL AIR INC	12	0.40	0.24	0.24	0.14	0.23	0.17	0.23	0.33	0.37	0.45
13 COMAIR INC	03	NA	0.29	NA	NA	NA	NA	NA	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	0.21	0.44	0.37	0.37	0.47	0.55	0.60	0.57	0.57	0.57
15 DELTA AIR LINES INC	06	0.29	0.28	0.29	0.33	0.40	0.45	0.49	0.48	0.39	0.44
16 EASTERN AIR LINES	12	0.58	0.52	0.52	0.50	0.37	0.44	0.50	0.51	0.56	0.49
17 EMPIRE AIRLINES INC	12	0.23	0.53	NA	NA	NA	NA	NA	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	0.39	0.20	NA	NA	NA	NA	NA	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	0.33	0.38	0.41	0.38	0.28	0.28	0.33	0.33	0.43	0.55
20 GREAT WESTERN AIRLINES INC	12	NA	0.49	0.60	0.50	0.37	0.51	0.53	0.65	NA	NA
21 HAWAIIAN AIRLINES INC	12	0.68	0.54	0.52	0.57	0.54	0.55	0.43	0.19	0.28	0.43
22 KLM ROYAL DUTCH AIRLINES	03	NA	0.43	0.40	0.30	0.35	0.43	0.44	0.43	0.47	0.45
23 METRO AIRLINES INC	04	0.45	0.44	NA	NA	NA	NA	NA	NA	NA	NA
24 MIDWAY AIRLINES INC	12	0.19	0.22	0.28	0.30	0.29	0.29	0.34	0.33	0.38	0.37
25 NORTHWEST AIRLINES INC	12	NA	0.00	0.30	0.76	0.24	0.12	0.23	0.24	NA	NA
26 OCEAN AIRWAYS	05	NA	0.00	0.30	0.76	0.24	0.12	0.23	0.24	NA	NA
27 OZARK AIR LINES INC	12	0.31	0.45	0.49	0.44	0.44	0.37	0.45	0.48	0.48	0.51
28 PSA INC	12	0.55	0.52	0.47	0.48	0.42	0.41	0.46	0.46	0.44	0.48
29 PAN AMERICAN WORLD AIRWAYS	12	0.43	0.44	0.43	0.43	0.59	0.53	0.57	0.55	0.57	0.60
30 PETROLEUM HELICOPTERS INC	04	NA	0.36	NA	NA	NA	NA	NA	NA	NA	NA
31 PIEDMONT AVIATION INC	12	0.44	0.48	0.50	0.52	0.53	0.50	0.54	0.58	0.44	0.69
32 REPUBLIC AIRLINES INC	12	0.65	0.63	0.49	0.47	0.41	0.46	0.37	0.32	0.39	0.38
33 ROCKY MOUNTAIN AIRWAYS INC	06	0.40	0.37	0.67	0.66	0.48	0.29	0.38	0.42	NA	NA
34 SOUTHWEST AIRLINES	12	0.31	0.44	0.59	0.60	0.62	0.49	0.63	0.66	0.71	0.71
35 STERLING OIL OF OKLAHOMA INC	12	NA	0.41	0.52	0.46	0.00	0.00	0.00	0.00	NA	NA
36 TACA INTERNATIONAL AIRLS S A	12	NA	0.32	0.44	0.52	0.28	0.38	0.41	0.45	NA	NA
37 TEXAS AIR CORP	12	0.45	0.55	0.53	0.56	0.42	0.42	0.45	0.41	0.49	0.53
38 TIGER INTERNATIONAL	12	0.71	0.69	0.70	0.70	0.70	0.70	0.72	0.70	0.70	0.68
39 TRANS WORLD CORP	12	0.44	0.44	0.46	0.50	0.40	0.53	0.55	0.53	0.56	0.57
40 UAL INC	12	0.35	0.36	0.40	0.42	0.42	0.47	0.51	0.51	0.52	0.55
41 USAIR INC	12	0.35	0.32	0.29	0.30	0.42	0.50	0.56	0.50	0.51	0.55
42 WESTERN AIR LINES INC	12	0.34	0.52	0.46	0.46	0.40	0.43	0.42	0.43	0.45	0.49
43 WITS INC	12	0.01	0.03	0.06	0.07	0.01	0.01	0.04	0.05	NA	NA
44 WORLD AIRWAYS INC	12	NA	0.69	0.61	0.66	0.23	0.29	0.31	0.29	0.18	0.47
45 WRIGHT AIR LINES INC	12	NA	0.77	0.79	0.10	0.15	0.16	0.19	0.00	NA	NA

Source: Standard &amp; Poor's

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## TTL NONCURRENT LIAB/TOTAL ASSETS

		1971	1970	1969
1 AIR CHAPARRAL INC	12	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	NA	NA	NA
3 AIR WISCONSIN INC	12	NA	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	NA	NA
5 ALASKA AIRLINES INC	12	0.43	0.27	0.35
6 ALOHA AIRLINES INC	12	NA	NA	NA
7 AMERICAN AIRLINES INC	12	0.48	0.58	0.57
8 AVIATION GROUP INC	06	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	NA	NA	NA
10 BRANIFF AIRWAYS INC	12	NA	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	0.58	0.58	0.58
12 CAPITOL AIR INC	12	0.45	0.48	0.47
13 COMAIR INC	03	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	0.62	0.63	0.59
15 DELTA AIR LINES INC	06	0.47	0.50	0.53
16 EASTERN AIR LINES	12	0.53	0.63	0.62
17 EMPIRE AIRLINES INC	12	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	0.58	0.57	0.65
20 GREAT WESTERN AIRLINES INC	12	NA	NA	NA
21 HAWAIIAN AIRLINES INC	12	0.53	0.56	0.57
22 KLM ROYAL DUTCH AIRLINES	03	0.40	0.40	0.34
23 METRC AIRLINES INC	04	NA	NA	NA
24 MIDWAY AIRLINES INC	12	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	0.41	0.42	0.30
26 OCEAN AIRWAYS	05	NA	NA	NA
27 OZARK AIR LINES INC	12	0.59	0.67	0.69
28 PSA INC	12	0.53	0.64	0.64
29 PAN AMERICAN WORLD AIRWAYS	12	0.60	0.63	0.58
30 PETROLEUM HELICOPTERS INC	04	NA	NA	NA
31 PIEDMONT AVIATION INC	12	0.74	0.75	0.76
32 REPUBLIC AIRLINES INC	12	0.48	0.51	0.59
33 ROCKY MOUNTAIN AIRWAYS INC	06	NA	NA	NA
34 SOUTHWEST AIRLINES	12	0.75	NA	NA
35 STERLING OIL OF OKLAHOMA INC	12	NA	NA	NA
36 TACA INTERNATIONAL AIRLS S A	12	NA	NA	NA
37 TEXAS AIR CORP	12	NA	NA	NA
38 TIGER INTERNATIONAL	12	0.72	0.65	0.67
39 TRANS WORLD CORP	12	0.59	0.62	0.59
40 UAL INC	12	0.55	0.59	0.55
41 USAIR INC	12	0.58	0.64	0.70
42 WESTERN AIR LINES INC	12	0.55	0.55	0.63
43 WITS INC	12	NA	NA	NA
44 WORLD AIRWAYS INC	12	0.55	0.56	0.61
45 WRIGHT AIR LINES INC	12	NA	NA	NA

Source: Standard &amp; Poors

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TTL NONCURRENT LIAB/TOTAL ASSETS

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
46 AIRLINE COMPOSITE	0.44	0.45	0.44	0.45	0.43	0.47	0.50	0.49	0.51	0.52
47 SLP 500 COMPOSITE	0.53	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.51	0.50
48 SLP 400 COMPOSITE	0.29	0.28	0.26	0.27	0.26	0.26	0.27	0.25	0.25	0.26

Source: Standard & Poors

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TTL NONCURRENT LIAB/TOTAL ASSETS

	1971	1970	1969
46 AIRLINE COMPOSITE	0.54	0.58	0.56
47 SEP 500 COMPOSITE	0.48	0.46	0.45
48 SEP 400 COMPOSITE	0.26	0.25	0.23

46 AIRLINE COMPOSITE  
47 SEP 500 COMPOSITE  
48 SEP 400 COMPOSITE

Source: Standard & Poors

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## TIMES INTEREST EARNED

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
1 AIR CHAPARRAL INC	12	NA	2.59	NA	NA	NA	NA	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	0.79	1.78	1.76	-9.16	-1.52	-2.01	-3.39	NA	NA
3 AIR WISCONSIN INC	12	3.47	5.41	13.04	9.77	6.01	3.07	2.90	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	-3.05	13.45	-2.24	-11.27	-0.59	1.34	NA	NA
5 ALASKA AIRLINES INC	12	2.75	1.83	4.37	3.13	3.73	3.39	2.06	1.35	-1.50
6 ALOMA AIRLINES INC	12	1.47	2.15	1.06	1.61	2.66	2.74	3.74	NA	NA
7 AMERICAN AIRLINES INC	12	1.27	-0.82	2.83	4.34	4.43	-0.10	1.96	-0.71	1.19
8 AVIATION GROUP INC	06	0.10	NA	NA	NA	NA	NA	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	0.75	-6.83	NA	NA	NA	NA	NA	NA	NA
10 BRANIFF AIRWAYS INC	12	-2.15	-0.85	2.82	3.45	2.96	2.54	2.81	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	-1.51	-0.47	-0.46	3.18	2.84	2.40	2.64	2.86	2.93
12 CAPITOL AIR INC	12	1.59	-0.58	-16.99	1.90	19.63	5.43	-0.20	2.31	1.83
13 COMAIR INC	03	NA	3.19	NA	NA	NA	NA	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	-0.06	0.15	3.01	2.04	1.45	0.53	1.27	0.95	1.98
15 DELTA AIR LINES INC	06	10.63	6.70	11.17	6.97	4.16	3.00	6.71	8.35	6.26
16 EASTERN AIR LINES	12	0.57	0.61	1.87	1.83	2.01	0.08	1.15	-0.25	1.08
17 EMPIRE AIRLINES INC	12	1.61	1.52	NA	NA	NA	NA	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	3.13	9.00	4.24	14.42	10.37	7.05	8.24	4.42	4.04
19 FRONTIER HOLDINGS INC	12	5.80	3.91	1.22	4.18	3.02	1.09	CF	NA	NA
20 GREAT WESTERN AIRLINES INC	12	NA	1.40	-0.22	NA	NA	NA	NA	NA	NA
21 HAWAIIAN AIRLINES INC	12	0.80	1.06	0.69	1.17	2.21	0.37	4.59	3.09	2.54
22 KLM ROYAL DUTCH AIRLINES	03	NA	1.11	2.32	2.72	1.84	0.73	0.08	0.20	0.23
23 METRO AIRLINES INC	04	NA	2.79	NA	NA	NA	NA	NA	NA	NA
24 MIDWAY AIRLINES INC	12	4.24	-3.82	NA	NA	NA	NA	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	1.53	-0.88	11.71	18.25	7.61	3.65	5.48	4.77	3.07
26 OCEAN AIRWAYS	05	NA	-10.05	-16.39	-6.07	4.70	-3.08	-0.51	NA	NA
27 QAZAR AIR LINES INC	12	3.46	0.70	0.39	4.14	3.97	1.18	2.69	0.96	2.13
28 PSA INC	12	2.78	1.79	3.36	2.23	2.51	-1.22	1.23	1.28	2.45
29 PAN AMERICAN WORLD AIRWAYS	12	-2.00	1.67	2.14	1.56	0.84	-0.03	-1.59	0.39	0.10
30 PETROLEUM HELICOPTERS INC	04	NA	1.90	NA	NA	NA	NA	NA	NA	NA
31 PIEDMONT AVIATION INC	12	CF	2.75	2.01	2.80	2.17	1.07	2.46	1.72	1.63
32 REPUBLIC AIRLINES INC	12	0.62	0.54	3.27	2.89	3.01	2.35	5.06	3.65	3.92
33 ROCKY MOUNTAIN AIRWAYS INC	06	0.50	2.87	1.17	-1.18	1.42	1.55	2.10	NA	NA
34 SOUTHWEST AIRLINES	12	7.15	4.95	5.07	3.71	6.34	3.83	2.58	1.14	-1.44
35 STERLING OIL CO OKLAHOMA INC	12	NA	1.60	1.58	NA	NA	NA	9.60	NA	NA
36 TACA INTERNATIONAL AIRLINES S A	12	NA	1.59	2.54	2.95	1.15	1.02	2.49	NA	NA
37 TEXAS AIR CORP	12	-0.01	1.35	2.70	3.50	2.42	-1.20	1.16	1.13	0.45
38 TIGER INTERNATIONAL	12	0.85	1.38	1.85	1.67	1.56	1.48	1.43	2.72	2.90
39 TRANS WORLD CORP	12	1.56	1.40	2.17	2.71	1.96	-0.57	0.64	2.82	2.82
40 UAL INC	12	-0.06	1.03	4.57	2.61	1.42	0.92	4.66	2.66	1.59
41 USAIR INC	12	4.07	5.12	3.33	2.39	1.48	0.20	1.47	1.62	1.64
42 WESTERN AIR LINES INC	12	-0.86	-0.13	2.33	3.38	3.48	1.48	4.64	4.36	2.71
43 WITS INC	12	4.01	2.73	0.90	3.02	-15.87	-97.30	56.78	NA	NA
44 WORLD AIRWAYS INC	12	NA	0.11	1.29	4.61	-0.68	4.65	2.59	0.61	3.28
45 WRIGHT AIR LINES INC	12	NA	6.60	-1.03	0.65	1.11	-2.63	0.02	NA	NA

Source: Standard &amp; Poor's

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## TIMES INTEREST EARNED

	1971	1970	1969
1 AIR CHAPARRAL INC	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	NA	NA	NA
3 AIR WISCONSIN INC	NA	NA	NA
4 AIRLIFT INTERNATIONAL INC	NA	NA	1.55
5 ALASKA AIRLINES INC	-3.31	-5.67	1.55
6 ALOMA AIRLINES INC	NA	NA	NA
7 AMERICAN AIRLINES INC	1.09	-0.07	2.43
8 AVIATION GROUP INC	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	NA	NA	NA
10 BRANIFF AIRWAYS INC	NA	NA	NA
11 BRANIFF INTERNATIONAL CORP	2.11	0.72	1.57
12 CAPITOL AIR INC	-1.29	-0.32	0.78
13 COMAIR INC	NA	NA	NA
14 CONTINENTAL AIR LINES INC	1.72	1.35	1.38
15 DELTA AIR LINES INC	3.65	4.87	6.81
16 EASTERN AIR LINES	1.19	1.17	0.91
17 EMPIRE AIRLINES INC	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	NA	NA	NA
19 FRONTIER HOLDINGS INC	0.31	0.18	-1.60
20 GREAT WESTERN AIRLINES INC	NA	NA	NA
21 HAWAIIAN AIRLINES INC	1.42	0.51	-0.13
22 KLM ROYAL DUTCH AIRLINES	-0.83	2.04	3.21
23 METRO AIRLINES INC	NA	NA	NA
24 MIDWAY AIRLINES INC	NA	NA	NA
25 NORTHWEST AIRLINES INC	1.90	8.08	35.68
26 OCEAN AIRWAYS	NA	NA	NA
27 OZARK AIR LINES INC	2.36	0.43	-0.15
28 PSA INC	2.08	1.81	1.77
29 PAM AMERICAN WORLD AIRWAYS	-0.04	-0.17	-0.04
30 PETROLEUM HELICOPTERS INC	NA	NA	NA
31 PIEDMONT AVIATION INC	1.07	0.55	0.27
32 REPUBLIC AIRLINES INC	1.42	1.64	0.18
33 ROCKY MOUNTAIN AIRWAYS INC	NA	NA	NA
34 SOUTHWEST AIRLINES	-3.10	NA	NA
35 STERLING OIL OF OKLAHOMA INC	NA	NA	NA
36 TACA INTERNATIONAL AIRLS S A	NA	NA	NA
37 TEXAS AIR CORP	NA	NA	NA
38 TIGER INTERNATIONAL	2.51	3.10	1.68
39 TRANS WORLD CORP	1.04	-1.53	1.51
40 UAL INC	0.90	0.12	2.65
41 USAIR INC	0.79	1.07	0.38
42 WESTERN AIR LINES INC	1.76	0.89	-0.85
43 WITS INC	NA	NA	NA
44 WORLD AIRWAYS INC	4.22	2.14	4.45
45 WRIGHT AIR LINES INC	NA	NA	NA

Source: Standard &amp; Poors

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TIMES INTEREST EARNED

46 AIRLINE COMPOSITE  
47 SEP 900 COMPOSITE  
48 SEP 400 COMPOSITE

1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
0.42	0.92	1.51	3.06	2.91	2.27	0.91	2.01	1.75	1.81
3.53	4.25	5.25	5.64	5.98	6.02	5.39	5.85	6.25	6.43
5.10	6.13	7.73	7.62	7.93	7.99	7.05	8.10	8.65	8.17

Source: Standard & Poors

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TIMES INTEREST EARNED

	1971	1970	1969
46 AIRLINE COMPOSITE	1.14	0.77	1.81
47 SEP 500 COMPOSITE	6.02	5.65	7.64
48 SEP 400 COMPOSITE	7.45	7.14	9.87

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Source: Standard & Poors

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## CURRENT RATIO

		1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
1 AIR CHAPARRAL INC	12	NA	1.05	NA	NA	NA	NA	NA	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	0.89	1.23	0.98	0.72	0.83	0.13	0.39	0.70	NA	NA
3 AIR WISCONSIN INC	12	1.15	1.37	1.93	1.30	1.18	0.91	1.06	0.90	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	0.47	1.04	1.82	0.76	NA	1.06	1.01	NA	NA
5 ALASKA AIRLINES INC	12	0.76	0.75	0.58	1.13	0.71	0.91	0.87	0.58	0.40	0.35
6 ALOMA AIRLINES INC	12	1.17	1.20	1.05	1.05	1.19	1.25	1.16	1.15	NA	NA
7 AMERICAN AIRLINES INC	12	0.99	0.99	1.12	1.32	1.46	1.39	1.19	1.05	1.07	1.01
8 AVIATION GROUP INC	06	0.36	NA	NA	NA	NA	NA	NA	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	04	0.66	0.20	NA	NA	NA	NA	NA	NA	NA	NA
10 BRANIFF AIRWAYS INC	12	0.57	0.67	0.74	0.87	1.18	1.11	1.16	1.24	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	0.49	0.58	0.74	0.91	1.20	1.11	1.14	1.23	1.20	1.30
12 CAPITOL AIR INC	12	0.47	0.40	0.40	0.45	0.82	0.49	0.52	1.10	0.87	0.75
13 COMAIR INC	03	NA	0.93	NA	NA	NA	NA	NA	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	0.39	0.73	0.72	0.48	0.72	0.75	0.87	0.69	0.75	0.95
15 DELTA AIR LINES INC	06	0.66	0.67	0.70	0.87	0.80	0.87	0.85	0.84	0.87	0.56
16 EASTERN AIR LINES	12	0.87	1.04	1.08	0.74	0.84	0.97	0.90	1.06	1.02	0.93
17 EMPIRE AIRLINES INC	12	1.71	0.75	NA	NA	NA	NA	NA	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	2.03	1.87	NA	NA	NA	NA	NA	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	1.00	0.95	0.91	0.95	1.67	1.39	1.47	1.34	1.38	1.40
20 GREAT WESTERN AIRLINES INC	12	NA	0.60	0.60	0.73	0.87	1.07	0.59	0.58	NA	NA
21 HAWAIIAN AIRLINES INC	12	1.05	0.71	0.83	0.48	1.10	1.21	1.67	1.04	0.94	1.00
22 KLM ROYAL DUTCH AIRLINES	03	NA	1.14	1.16	1.09	1.05	1.34	1.18	0.81	0.58	1.00
23 METRO AIRLINES INC	04	NA	1.03	NA	NA	NA	NA	NA	NA	NA	NA
24 MIDWAY AIRLINES INC	12	1.40	1.45	NA	NA	NA	NA	NA	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	0.65	0.60	1.00	1.64	1.44	0.80	0.93	0.81	0.87	1.15
26 OCEAN AIRWAYS	05	NA	0.13	1.09	1.44	0.69	0.95	0.48	0.72	NA	NA
27 OZARK AIR LINES INC	12	0.73	0.69	0.72	0.85	0.91	0.88	0.83	1.03	1.02	1.12
28 PSA INC	12	1.47	0.79	1.17	1.29	1.71	2.24	1.75	1.06	1.34	2.25
29 PAN AMERICAN WORLD AIRWAYS	12	0.80	0.94	0.64	1.04	1.18	1.39	1.02	0.98	1.19	1.36
30 PETROLEUM HELICOPTERS INC	04	NA	1.62	NA	NA	NA	NA	NA	NA	NA	NA
31 PIEDMONT AVIATION INC	12	0.96	1.37	1.19	1.12	1.21	1.18	1.07	1.03	1.11	1.09
32 REPUBLIC AIRLINES INC	12	0.80	0.95	1.06	0.94	0.92	1.10	1.05	1.14	1.16	1.18
33 ROCKY MOUNTAIN AIRWAYS INC	06	0.75	0.81	0.56	0.43	0.29	0.21	0.25	0.31	NA	NA
34 SOUTHWEST AIRLINES	12	1.23	1.53	1.64	3.39	2.82	3.87	2.12	0.98	1.44	0.81
35 STERLING OIL CO OKLAHOMA INC	12	NA	0.95	0.98	1.09	5.09	8.09	5.64	6.06	NA	NA
36 TACA INTERNATIONAL AIRLINES S A	12	NA	0.77	0.75	0.93	0.83	0.80	0.87	0.87	NA	NA
37 TEXAS AIR CORP	12	0.53	2.37	2.29	0.89	0.91	0.91	0.84	0.84	0.96	0.93
38 TIGER INTERNATIONAL	12	1.21	1.02	1.25	1.34	1.44	1.54	1.55	1.33	2.11	1.51
39 TRANS WORLD CORP	12	0.90	0.86	1.00	1.06	1.09	1.24	1.13	1.00	1.15	1.15
40 UAL INC	12	0.69	0.85	0.99	1.29	1.49	1.57	1.62	1.74	1.38	1.06
41 USAIR INC	12	1.09	1.09	1.16	1.11	1.24	1.17	1.10	1.19	1.18	1.14
42 WESTERN AIR LINES INC	12	0.39	0.78	0.86	1.01	1.03	0.90	1.02	0.91	1.07	1.26
43 WITS INC	12	0.77	0.74	0.76	0.66	0.76	0.73	0.89	1.17	NA	NA
44 WORLD AIRWAYS INC	12	NA	0.66	1.17	1.74	3.03	2.84	2.64	2.22	1.33	1.00
45 WRIGHT AIR LINES INC	12	NA	0.85	0.42	0.20	0.27	0.18	0.16	0.14	NA	NA

Source: Standard &amp; Poor's

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## CURRENT RATIO

		1971	1970	1969
1 AIR CHAPARRAL INC	12	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	NA	NA	NA
3 AIR WISCONSIN INC	12	NA	NA	NA
4 AIRPLIFT INTERNATIONAL INC	06	NA	NA	NA
5 ALASKA AIRLINES INC	12	0.36	0.41	0.61
6 ALOMA AIRLINES INC	12	NA	NA	NA
7 AMERICAN AIRLINES INC	12	1.04	1.02	1.29
8 AVIATION GROUP INC	06	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	NA	NA	NA
10 BRANTIFF AIRWAYS INC	12	NA	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	1.62	1.20	1.09
12 CAPITOL AIR INC	12	0.35	0.64	0.61
13 COMAIR INC	03	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	1.04	0.96	0.91
15 DELTA AIR LINES INC	06	0.78	1.17	1.22
16 EASTERN AIR LINES	12	1.18	1.15	1.14
17 EMPIRE AIRLINES INC	12	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	0.86	0.94	0.79
20 GREAT WESTERN AIRLINES INC	12	NA	NA	NA
21 HAWAIIAN AIRLINES INC	12	0.90	0.77	0.66
22 KLM ROYAL DUTCH AIRLINES	03	0.95	0.91	1.02
23 METRO AIRLINES INC	04	NA	NA	NA
24 MIDWAY AIRLINES INC	12	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	1.51	1.68	0.93
26 OCEAN AIRWAYS	05	NA	NA	NA
27 OZARK AIR LINES INC	12	1.32	0.78	0.97
28 PSA INC	12	2.27	1.43	1.22
29 PAN AMERICAN WORLD AIRWAYS	12	1.29	1.38	1.51
30 PETROLEUM HELICOPTERS INC	04	NA	NA	NA
31 PIEDMONT AVIATION INC	12	1.17	1.01	1.06
32 REPUBLIC AIRLINES INC	12	1.18	0.75	0.79
33 ROCKY MOUNTAIN AIRWAYS INC	06	NA	NA	NA
34 SOUTHWEST AIRLINES	12	1.69	NA	NA
35 STERLING OIL OF OKLAHOMA INC	12	NA	NA	NA
36 TACA INTERNATIONAL AIRLS S A	12	NA	NA	NA
37 TEXAS AIR CORP	12	NA	NA	NA
38 TIGER INTERNATIONAL	12	2.10	2.24	2.47
39 TRANS WORLD CORP	12	1.19	1.11	1.79
40 UAL INC	12	1.20	1.11	1.08
41 USAIR INC	12	1.19	1.07	1.02
42 WESTERN AIR LINES INC	12	1.81	1.53	1.37
43 WITS INC	12	NA	NA	NA
44 WORLD AIRWAYS INC	12	1.16	1.30	1.31
45 WRIGHT AIR LINES INC	12	NA	NA	NA

Source: Standard &amp; Poors

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CURRENT RATIO

44 AIRLINE COMPOSITE  
47 SEP 500 COMPOSITE  
48 SEP 400 COMPOSITE

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
44 AIRLINE COMPOSITE	0.77	0.90	0.97	1.10	1.20	1.24	1.15	1.10	1.13	1.11
47 SEP 500 COMPOSITE	1.44	1.46	1.50	1.58	1.65	1.69	1.67	1.60	1.69	1.76
48 SEP 400 COMPOSITE	1.53	1.56	1.60	1.68	1.76	1.80	1.65	1.72	1.83	1.90

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CURRENT RATIO

	1971	1970	1969
46 AIRLINE COMPOSITE	1.20	1.15	1.25
47 SEP 500 COMPOSITE	1.73	1.69	1.75
48 SEP 400 COMPOSITE	1.87	1.83	1.88

46 AIRLINE COMPOSITE  
47 SEP 500 COMPOSITE  
48 SEP 400 COMPOSITE

Source: Standard & Poors

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## OPERATING FUNDS

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
1 AIR CHAPARRAL INC	12	NA	0.28	NA	NA	NA	NA	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	12.76	8.46	3.82	-2.29	-0.33	-0.36	-0.46	NA	NA
3 AIR WISCONSIN INC	12	13.29	9.47	4.57	2.35	1.08	1.06	0.85	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	-1.22	10.87	-0.77	-2.05	1.80	2.30	NA	NA
5 ALASKA AIRLINES INC	12	20.27	12.02	9.46	15.26	9.05	6.59	3.87	1.60	-1.51
6 ALOMA AIRLINES INC	12	9.43	10.36	6.14	7.74	3.19	2.00	2.53	NA	NA
7 AMERICAN AIRLINES INC	12	259.63	65.79	253.26	303.35	184.03	79.43	148.21	64.75	120.53
8 AVIATION GROUP INC	06	-0.69	NA	NA	NA	NA	NA	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	0.38	-1.15	NA	NA	NA	NA	NA	NA	NA
10 BRANIFF AIRWAYS INC	12	-73.68	-39.32	3.19	118.19	74.53	64.76	71.60	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	-74.61	-47.42	-2.41	118.25	76.54	64.61	70.81	56.71	45.73
12 CAPITOL AIR INC	12	11.18	4.38	-2.76	1.56	5.86	4.17	2.43	4.31	4.79
13 COMAIR INC	03	NA	0.35	NA	NA	NA	NA	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	0.30	21.71	22.47	99.71	62.10	34.20	61.10	44.80	55.26
15 DELTA AIR LINES INC	06	405.91	308.33	351.79	325.57	311.48	215.41	237.12	166.96	139.62
16 EASTERN AIR LINES	12	173.04	166.41	241.95	238.91	144.82	53.71	107.98	29.80	109.73
17 EMPIRE AIRLINES INC	12	1.58	0.98	NA	NA	NA	NA	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	CF	CF	NA	NA	NA	NA	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	68.39	51.59	46.13	33.60	23.33	14.17	15.33	13.17	14.21
20 GREAT WESTERN AIRLINES INC	12	NA	0.48	-0.02	0.35	0.58	0.60	0.27	NA	NA
21 HAWAIIAN AIRLINES INC	12	13.71	3.73	6.31	3.55	3.60	1.58	4.45	3.57	3.09
22 KLM ROYAL DUTCH AIRLINES	03	NA	90.00	90.00	139.10	154.00	41.00	37.00	29.00	NA
23 METRO AIRLINES INC	04	NA	2.71	NA	NA	NA	NA	NA	NA	NA
24 MIDWAY AIRLINES INC	12	8.38	-3.84	NA	NA	NA	NA	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	139.86	77.93	201.55	196.12	255.43	148.63	187.64	136.53	102.10
26 OCEAN AIRWAYS	05	NA	-1.82	-1.44	-0.02	-0.07	-0.07	0.04	NA	NA
27 OZARK AIR LINES INC	12	40.70	20.19	18.98	26.74	26.25	14.43	15.28	8.09	11.01
28 PSA INC	12	CF	CF	CF	CF	19.39	1.35	17.02	12.15	21.12
29 PAN AMERICAN WORLD AIRWAYS	12	-21.07	314.34	248.04	290.96	197.92	66.46	-12.98	87.42	79.99
30 PETROLEUM HELICOPTERS INC	04	NA	14.72	NA	NA	NA	NA	NA	NA	NA
31 PIEDMONT AVIATION INC	12	69.76	40.81	32.53	22.40	21.64	12.78	19.28	16.17	14.30
32 REPUBLIC AIRLINES INC	12	CF	CF	40.28	41.37	28.40	12.47	18.58	13.98	13.91
33 ROCKY MOUNTAIN AIRWAYS INC	06	0.50	2.65	1.08	0.53	-0.17	0.31	0.46	NA	NA
34 SOUTHWEST AIRLINES	12	58.84	47.92	28.59	30.43	11.83	4.34	2.95	1.67	-0.30
34 SOUTHERN OIL OF OKLAHOMA INC	12	NA	0.66	0.35	0.20	0.14	0.06	0.06	NA	NA
36 TACA INTERNATIONAL AIRLINES S A	12	NA	2.67	0.83	2.84	1.65	0.75	1.36	NA	NA
37 TEXAS AIR CORP	12	-6.75	22.91	54.41	16.48	11.84	0.67	5.20	4.32	3.16
38 TIGER INTERNATIONAL	12	125.07	172.88	153.77	157.86	103.93	72.27	64.32	89.50	80.25
39 TRANS WORLD CORP	12	298.44	258.51	225.06	269.34	204.38	178.71	89.17	183.03	161.19
40 UAL INC	12	160.65	294.63	112.92	575.03	295.07	197.88	391.73	257.50	215.79
41 USAIR INC	12	113.70	110.56	77.23	72.11	36.11	8.04	23.52	24.42	20.08
42 WESTERN AIR LINES INC	12	-30.24	9.30	86.33	90.26	57.07	44.32	76.45	57.25	46.40
43 WITS INC	12	0.63	0.63	0.40	0.18	0.30	-0.56	0.40	NA	NA
44 WORLD AIRWAYS INC	12	NA	-9.27	32.29	24.97	5.43	21.27	11.39	4.61	14.53
45 WRIGHT AIR LINES INC	12	NA	0.86	0.17	-0.07	0.05	-0.36	-0.03	NA	NA

Source: Standard &amp; Poors

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## OPERATING FUNDS

		1971	1970	1969
1 AIR CHAMPARRAL INC	12	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	NA	NA	NA
3 AIR WISCONSIN INC	12	NA	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	NA	NA
5 ALASKA AIRLINES INC	12	-9.98	NA	NA
6 ALOMA AIRLINES INC	12	NA	NA	NA
7 AMERICAN AIRLINES INC	12	112.19	NA	NA
8 AVIATION GROUP INC	06	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	NA	NA	NA
10 BRANIFF AIRWAYS INC	12	NA	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	36.95	NA	NA
12 CAPITOL AIR INC	12	0.67	NA	NA
13 COMAIR INC	03	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	48.47	NA	NA
15 DELTA AIR LINES INC	06	123.59	NA	NA
16 EASTERN AIR LINES	12	86.85	NA	NA
17 EMPIRE AIRLINES INC	12	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	3.83	NA	NA
20 GREAT WESTERN AIRLINES INC	12	NA	NA	NA
21 HAWAIIAN AIRLINES INC	12	3.20	NA	NA
22 KLM ROYAL DUTCH AIRLINES	03	NR	NA	NA
23 METRO AIRLINES INC	04	NA	NA	NA
24 MIDWAY AIRLINES INC	12	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	105.81	NA	NA
26 OCEAN AIRWAYS	09	NA	NA	NA
27 OZARK AIR LINES INC	12	11.23	NA	NA
28 PSA INC	12	20.75	NA	NA
29 PAN AMERICAN WORLD AIRWAYS	12	52.57	NA	NA
30 PETROLEUM HELICOPTERS INC	04	NA	NA	NA
31 PIEDMONT AVIATION INC	12	10.15	NA	NA
32 REPUBLIC AIRLINES INC	12	9.19	NA	NA
33 ROCKY MOUNTAIN AIRWAYS INC	06	NA	NA	NA
34 SOUTHWEST AIRLINES	12	-1.56	NA	NA
35 STERLING OIL OF OKLAHOMA INC	12	NA	NA	NA
36 TACA INTERNATIONAL AIRLS S A	12	NA	NA	NA
37 TEXAS AIR CORP	12	NA	NA	NA
38 TIGER INTERNATIONAL	12	60.76	NA	NA
39 TRANS WORLD CORP	12	113.46	NA	NA
40 UAL INC	12	160.80	NA	NA
41 USAIR INC	12	9.86	NA	NA
42 WESTERN AIR LINES INC	12	45.98	NA	NA
INC	12	NA	NA	NA
AIRWAYS INC	12	19.07	NA	NA
T AIR LINES INC	12	NA	NA	NA

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Source: Standard &amp; Poors

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OPERATING FUNDS

46 AIRLINE COMPOSITE  
47 SEP 500 COMPOSITE  
48 SEP 400 COMPOSITE

1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
1871.50	2094.03	2399.27	3259.24	2403.36	1902.13	1204.98	1677.23	1352.50	1274.96
204615.04	188125.44	17452.48	162065.81	1123486.31	111672.37	94861.31	92089.62	81925.53	62594.08
175889.76	162952.62	148752.75	121582.00	105314.68	95775.81	81719.50	80654.43	71843.62	58639.64

Source: Standard & Poors

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OPERATING FUNDS

	1971	1970	1969
46 AIRLINE COMPOSITE	1032.83	0.00	0.00
47 SEP 500 COMPOSITE	55422.13	0.00	0.00
48 SEP 400 COMPOSITE	52023.71	0.00	0.00

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Source: Standard & Poors

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## CAPITAL EXPENDITURES

		1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
1 AIR CHARRAL INC	12	NA	0.84	NA	NA	NA	NA	NA	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	187.88	64.42	11.63	9.58	0.19	0.22	0.30	0.49	NA	NA
3 AIR WISCONSIN INC	12	30.55	23.41	5.49	2.39	1.24	2.12	1.00	3.32	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	13.41	19.95	18.64	3.18	0.40	0.67	1.65	NA	NA
5 ALASKA AIRLINES INC	12	52.69	35.30	11.25	20.33	13.52	9.82	22.40	14.32	2.13	3.95
6 ALOMA AIRLINES INC	12	19.69	15.20	23.60	7.13	17.41	4.18	2.80	0.68	NA	NA
7 AMERICAN AIRLINES INC	12	543.28	431.33	352.70	307.03	242.11	76.93	44.98	59.41	43.26	311.15
8 AVIATION GROUP INC	06	2.76	NA	NA	NA	NA	NA	NA	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	2.07	1.53	NA	NA	NA	NA	NA	NA	NA	NA
10 BRANTIFF AIRWAYS INC	12	3.49	192.73	320.36	182.38	87.21	89.61	67.09	52.32	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	5.23	233.86	322.82	182.62	87.41	89.76	70.75	52.31	146.59	78.41
12 CAPITOL AIR INC	12	26.45	8.11	15.25	4.71	1.60	2.42	13.67	0.12	0.31	0.41
13 COMAIR INC	03	NA	0.17	NA	NA	NA	NA	NA	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	136.51	211.61	42.54	61.34	28.95	18.04	138.20	134.62	134.44	141.58
15 DELTA AIR LINES INC	06	471.27	343.31	364.74	204.76	245.20	219.40	356.96	458.91	128.53	65.69
16 EASTERN AIR LINES	12	576.35	575.69	400.73	408.31	105.29	90.42	85.57	64.06	319.65	322.25
17 EMPIRE AIRLINES INC	12	2.12	2.24	NA	NA	NA	NA	NA	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	24.35	2.32	NA	NA	NA	NA	NA	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	51.06	56.30	82.98	93.53	13.43	19.38	15.42	10.35	7.03	16.23
20 GREAT WESTERN AIRLINES INC	12	NA	0.10	0.70	1.81	0.36	0.23	0.66	0.99	NA	NA
21 HAWAIIAN AIRLINES INC	12	83.42	18.88	22.29	24.49	7.53	34.85	5.66	0.95	1.31	0.84
22 KLM ROYAL DUTCH AIRLINES	03	NA	202.00	307.00	134.00	188.00	18.00	74.00	78.00	88.00	121.00
23 METRO AIRLINES INC	04	NA	4.22	NA	NA	NA	NA	NA	NA	NA	NA
24 MIDWAY AIRLINES INC	12	CF	12.83	NA	NA	NA	NA	NA	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	50.68	221.15	341.34	188.51	200.50	119.45	203.96	174.08	276.51	117.84
26 OCEAN AIRWAYS	05	NA	0.08	1.27	0.67	0.00	0.02	0.05	0.05	NA	NA
27 OZARK AIR LINES INC	12	25.56	27.74	134.45	20.29	34.20	4.75	18.19	20.81	5.47	9.38
28 PSA INC	12	209.18	64.99	84.79	36.48	29.02	2.94	4.84	32.70	16.81	4.51
29 PAN AMERICAN WORLD AIRWAYS	12	397.64	534.59	329.63	207.44	217.53	58.55	69.24	85.95	55.53	133.24
30 PETROLEUM HELICOPTERS INC	04	NA	27.02	NA	NA	NA	NA	NA	NA	NA	NA
31 PIEDMONT AVIATION INC	12	160.13	75.14	80.43	55.65	18.46	7.74	3.60	18.38	9.18	11.48
32 REPUBLIC AIRLINES INC	12	195.32	421.07	115.39	81.09	32.45	56.48	22.78	3.23	25.34	4.54
33 ROCKY MOUNTAIN AIRWAYS INC	06	1.51	0.19	3.77	5.21	0.18	0.22	0.88	1.24	NA	NA
34 SOUTHWEST AIRLINES	12	79.38	56.69	54.52	45.15	41.45	13.74	6.30	6.34	0.84	0.15
35 STERLING OIL OF OKLAHOMA INC	12	NA	0.19	0.95	0.93	0.06	0.02	0.04	0.00	NA	NA
36 TACA INTERNATIONAL AIRLS S A	12	NA	0.46	0.60	10.93	0.59	2.49	0.21	0.25	NA	NA
37 TEXAS AIR CORP	12	786.03	37.40	75.47	41.42	23.35	10.19	8.47	6.59	2.09	12.76
38 TIGER INTERNATIONAL	12	226.40	549.51	357.26	210.98	192.81	85.63	100.84	212.08	167.88	72.23
39 TRANS WORLD CORP	12	415.43	519.99	353.03	186.22	90.64	91.46	225.73	297.64	227.52	201.44
40 UAL INC	12	450.51	440.92	551.83	591.67	225.76	94.46	244.41	253.55	127.65	324.00
41 USAIR INC	12	217.80	112.23	76.11	68.77	14.22	20.74	47.01	34.03	6.82	113.99
42 WESTERN AIR LINES INC	12	53.56	176.17	187.39	153.98	74.04	43.07	41.61	92.35	74.32	59.19
43 WITS INC	12	0.67	0.48	0.26	0.16	0.05	0.06	0.10	0.15	NA	NA
44 WORLD AIRWAYS INC	12	NA	141.30	125.23	151.39	5.51	5.43	0.51	30.89	6.74	1.00
45 WRIGHT AIR LINES INC	12	NA	0.68	0.56	0.52	0.77	0.80	0.21	0.29	NA	NA

Source: Standard &amp; Poors

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## CAPITAL EXPENDITURES

		1971	1970	1969
1 AIR CHAPARRAL INC	12	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	NA	NA	NA
3 AIR WISCONSIN INC	12	NA	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	NA	NA
5 ALASKA AIRLINES INC	12	1.95	3.01	2.16
6 ALOMA AIRLINES INC	12	NA	NA	NA
7 AMERICAN AIRLINES INC	12	319.85	188.89	119.45
8 AVIATION GROUP INC	06	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	NA	NA	NA
10 BRANIFF AIRWAYS INC	12	NA	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	18.48	11.29	13.06
12 CAPITOL AIR INC	12	0.49	0.67	14.45
13 COMAIR INC	03	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	31.74	113.35	25.36
15 DELTA AIR LINES INC	06	126.57	99.81	210.77
16 EASTERN AIR LINES	12	87.84	211.39	139.83
17 EMPIRE AIRLINES INC	12	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	1.91	2.53	18.71
20 GREAT WESTERN AIRLINES INC	12	NA	NA	NA
21 HAWAIIAN AIRLINES INC	12	0.53	0.83	9.39
22 KLM ROYAL DUTCH AIRLINES	33	118.00	110.00	132.00
23 METRO AIRLINES INC	04	NA	NA	NA
24 MIDWAY AIRLINES INC	12	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	127.78	231.40	192.32
26 OCEAN AIRWAYS	05	NA	NA	NA
27 OZARK AIR LINES INC	12	0.88	6.43	12.99
28 PSA INC	12	12.71	25.12	62.02
29 PAN AMERICAN WORLD AIRWAYS	12	130.81	383.66	178.20
30 PETROLEUM HELICOPTERS INC	04	NA	NA	NA
31 PIEDMONT AVIATION INC	12	2.01	7.64	46.14
32 REPUBLIC AIRLINES INC	12	1.59	10.19	12.47
33 ROCKY MOUNTAIN AIRWAYS INC	06	NA	NA	NA
34 SOUTHWEST AIRLINES	12	18.95	NA	NA
35 STERLING OIL OF OKLAHOMA INC	12	NA	NA	NA
36 TACA INTERNATIONAL AIRLS S A	12	NA	NA	NA
37 TEXAS AIR CORP	12	NA	NA	NA
38 TIGER INTERNATIONAL	12	570.79	11.90	25.38
39 TRANS WORLD CORP	12	125.97	238.59	197.40
40 UAL INC	12	151.26	262.91	270.14
41 USAIR INC	12	6.87	18.07	43.48
42 WESTERN AIR LINES INC	12	3.42	4.36	59.01
43 WITS INC	12	NA	NA	NA
44 WORLD AIRWAYS INC	12	39.43	0.91	1.38
45 WRIGHT AIR LINES INC	12	NA	NA	NA

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Source: Standard &amp; Poors

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CAPITAL EXPENDITURES

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
46 AIRLINE COMPOSITE	5498.96	5057.60	5178.26	3720.20	2244.19	1293.57	1899.10	2203.11	1849.56	2127.24
47 SEP 500 COMPOSITE	201113.28	186028.96	141830.93	122013.93	104542.06	91825.56	86188.37	89551.43	69021.56	58117.08
48 SEP 400 COMPOSITE	168557.60	155044.43	133394.71	98877.68	85026.43	75731.75	70753.56	71394.62	54323.52	44672.19

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CAPITAL EXPENDITURES

	1971	1970	1969
46 AIRLINE COMPOSITE	1899.63	1542.93	1786.11
47 SEP 500 COMPOSITE	55902.87	55855.19	50916.31
48 SEP 400 COMPOSITE	42911.55	44203.55	41144.57

46 AIRLINE COMPOSITE  
47 SEP 500 COMPOSITE  
48 SEP 400 COMPOSITE

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## TOTAL SOURCES OF FUNDS

		1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
1 AIR CHAPARRAL INC	12	NA	1-21	NA	NA	NA	NA	NA	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	281.40	108.51	33.93	10.64	5.77	0.04	0.14	0.60	NA	NA
3 AIR WISCONSIN INC	12	35.10	29.59	12.62	3.46	2.51	2.45	1.64	3.95	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	11.96	25.40	33.19	2.36	-0.46	1.40	1.52	NA	NA
5 ALASKA AIRLINES INC	12	93.19	47.91	18.75	42.67	12.16	25.33	32.72	22.31	7.85	11.28
6 ALOMA AIRLINES INC	12	25.25	24.91	24.00	13.12	22.32	8.62	5.38	4.40	NA	NA
7 AMERICAN AIRLINES INC	12	692.77	534.47	562.65	439.48	432.97	296.74	188.03	229.00	123.11	252.42
8 AVIATION GROUP INC	06	8.43	NA	NA	NA	NA	NA	NA	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	3.96	0.96	NA	NA	NA	NA	NA	NA	NA	NA
10 BRANIFF AIRWAYS INC	12	11.86	249.97	530.28	340.21	229.05	248.50	117.83	130.52	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	19.03	279.49	529.47	344.54	236.32	253.37	123.65	132.32	204.59	112.39
12 CAPITOL AIR INC	12	33.75	10.36	2.46	2.91	7.49	6.42	9.50	5.11	4.67	15.13
13 COMAIR INC	03	NA	0.37	NA	NA	NA	NA	NA	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	179.17	256.99	129.69	116.00	78.75	71.71	156.73	167.32	188.67	251.68
15 DELTA AIR LINES INC	06	482.46	404.87	377.66	353.92	357.24	300.03	352.90	475.10	162.73	147.78
16 EASTERN AIR LINES	12	663.32	917.34	730.27	552.31	322.51	295.28	170.39	210.16	446.57	430.07
17 EMPIRE AIRLINES INC	12	8.71	3.50	NA	NA	NA	NA	NA	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	40.50	2.84	NA	NA	NA	NA	NA	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	111.67	88.13	120.18	71.60	31.25	22.14	16.40	27.14	20.94	39.73
20 GREAT WESTERN AIRLINES INC	12	NA	0.61	1.89	2.12	1.13	0.83	1.11	1.84	NA	NA
21 HAWAIIAN AIRLINES INC	12	152.32	29.08	34.73	21.45	9.68	39.91	19.47	4.47	9.02	4.48
22 KLM ROYAL DUTCH AIRLINES	12	NA	291.00	429.00	293.00	204.00	165.00	246.00	101.00	96.00	155.00
23 METRO AIRLINES INC	04	NA	6.33	NA	NA	NA	NA	NA	NA	NA	NA
24 MIDWAY AIRLINES INC	12	43.10	21.40	NA	NA	NA	NA	NA	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	146.14	78.37	204.36	208.43	273.36	196.79	192.78	217.52	238.62	257.69
26 OCEAN AIRWAYS	05	NA	-0.63	1.73	1.19	0.10	0.52	-0.02	0.06	NA	NA
27 OZARK AIR LINES INC	12	73.93	59.17	112.29	52.51	58.34	28.98	28.47	42.68	10.60	15.19
28 PSA INC	12	355.93	153.49	156.12	62.44	38.91	26.38	40.25	62.95	33.32	38.42
29 PAN AMERICAN WORLD AIRWAYS	12	817.83	852.15	454.93	609.33	378.58	222.89	123.96	36.67	217.53	134.37
30 PETROLEUM HELICOPTERS INC	04	NA	85.70	NA	NA	NA	NA	NA	NA	NA	NA
31 PIEDMONT AVIATION INC	12	171.42	118.99	135.02	51.40	57.12	22.67	16.39	29.68	20.25	22.81
32 REPUBLIC AIRLINES INC	12	227.10	469.66	253.36	113.67	57.06	63.29	48.59	19.85	34.45	18.32
33 ROCKY MOUNTAIN AIRWAYS INC	06	2.48	5.72	6.67	6.40	2.04	0.45	1.59	1.95	NA	NA
34 SOUTHWEST AIRLINES	12	97.81	92.19	87.22	45.56	39.57	25.49	10.08	8.51	1.83	3.89
35 STEELING OIL OF OKLAHOMA INC	12	NA	0.87	2.68	1.89	0.17	0.10	0.23	0.07	NA	NA
36 TACA INTERNATIONAL AIRL S A	12	NA	3.61	0.86	18.43	1.85	3.08	1.10	1.45	NA	NA
37 TEXAS AIR CORP	12	221.89	81.42	233.36	111.74	33.82	18.78	7.53	7.84	5.40	20.88
38 TIGER INTERNATIONAL	12	539.89	903.79	643.58	452.26	438.62	336.25	244.97	330.98	257.13	179.96
39 TRANS WORLD CORP	12	787.35	764.49	635.21	403.05	377.29	264.26	332.49	347.70	507.13	322.32
40 UAL INC	12	507.91	779.40	759.36	789.21	445.24	433.06	303.77	567.62	341.85	295.62
41 USAIR INC	12	298.21	303.98	185.79	207.34	49.38	84.19	67.74	64.78	32.41	122.54
42 WESTERN AIR LINES INC	12	102.77	232.86	216.75	181.34	106.25	87.72	75.10	105.92	67.62	49.26
43 WITS INC	12	1.09	1.41	0.70	1.21	0.29	1.96	0.04	1.00	NA	NA
44 WORLD AIRWAYS INC	12	NA	150.26	184.32	261.04	44.80	10.29	22.51	68.57	51.58	17.00
45 WRIGHT AIR LINES INC	12	NA	2.14	2.88	0.08	0.62	0.30	0.03	0.12	NA	NA

Source: Standard &amp; Poors

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## TOTAL SOURCES OF FUNDS

		1971	1970	1969
1 AIR CHAPARRAL INC	12	NA	NA	NA
2 AIR FLORIDA SYSTEM INC	12	NA	NA	NA
3 AIR WISCONSIN INC	12	NA	NA	NA
4 AIRLIFT INTERNATIONAL INC	06	NA	NA	NA
5 ALASKA AIRLINES INC	12	6.36	NA	NA
6 ALOMA AIRLINES INC	12	NA	NA	NA
7 AMERICAN AIRLINES INC	12	545.05	NA	NA
8 AVIATION GROUP INC	06	NA	NA	NA
9 BIG SKY TRANSPORTATION-CL A	06	NA	NA	NA
10 BRANIFF AIRWAYS INC	12	NA	NA	NA
11 BRANIFF INTERNATIONAL CORP	12	154.88	NA	NA
12 CAPITOL AIR INC	12	0.52	NA	NA
13 COMAIR INC	03	NA	NA	NA
14 CONTINENTAL AIR LINES INC	12	81.29	NA	NA
15 DELTA AIR LINES INC	06	144.24	NA	NA
16 EASTERN AIR LINES	12	335.57	NA	NA
17 EMPIRE AIRLINES INC	12	NA	NA	NA
18 FLIGHT TRANSPORTATION CORP	06	NA	NA	NA
19 FRONTIER HOLDINGS INC	12	8.10	NA	NA
20 GREAT WESTERN AIRLINES INC	12	NA	NA	NA
21 HAWAIIAN AIRLINES INC	12	4.04	NA	NA
22 KLM ROYAL DUTCH AIRLINES	03	167.00	NA	NA
23 METRO AIRLINES INC	04	NA	NA	NA
24 MIDWAY AIRLINES INC	12	NA	NA	NA
25 NORTHWEST AIRLINES INC	12	123.67	NA	NA
26 OCEAN AIRWAYS	05	NA	NA	NA
27 OZARK AIR LINES INC	12	16.66	NA	NA
28 PSA INC	12	50.71	NA	NA
29 PAN AMERICAN WORLD AIRWAYS	12	261.81	NA	NA
30 PETROLEUM HELICOPTERS INC	04	NA	NA	NA
31 PIEDMONT AVIATION INC	12	14.06	NA	NA
32 REPUBLIC AIRLINES INC	12	26.50	NA	NA
33 ROCKY MOUNTAIN AIRWAYS INC	06	NA	NA	NA
34 SOUTHWEST AIRLINES	12	22.33	NA	NA
35 STERLING OIL OF OKLAHOMA INC	12	NA	NA	NA
36 TACA INTERNATIONAL AIRL S A	12	NA	NA	NA
37 TEXAS AIR CORP	12	NA	NA	NA
38 TIGER INTERNATIONAL	12	126.08	NA	NA
39 TRANS WORLD CORP	12	342.58	NA	NA
40 UAL INC	12	290.81	NA	NA
41 USATA INC	12	29.38	NA	NA
42 WESTERN AIR LINES INC	12	50.66	NA	NA
43 WITS INC	12	NA	NA	NA
44 WORLD AIRWAYS INC	12	57.57	NA	NA
45 WRIGHT AIR LINES INC	12	NA	NA	NA

Source: Standard &amp; Poors

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TOTAL SOURCES OF FUNDS

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
46 AIRLINE COMPOSITE	7237.70	8440.79	7840.11	6219.12	4358.88	3563.14	2961.05	3432.64	3153.85	2918.63
47 SEP 500 COMPOSITE	326415.36	280648.00	246384.16	200000.80	176535.36	159600.37	136931.18	130442.68	106119.56	91489.50
48 SEP 400 COMPOSITE	287475.04	246443.04	211207.36	170767.52	148780.87	136391.31	124605.50	121310.25	98625.81	94886.62

46 AIRLINE COMPOSITE  
47 SEP 500 COMPOSITE  
48 SEP 400 COMPOSITE

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TOTAL SOURCES OF FUNDS

	1971	1970	1969
44 AIRLINE COMPOSITE	2859.86	0.00	0.00
47 SEP 500 COMPOSITE	84906.93	0.00	0.00
48 SEP 400 COMPOSITE	78073.56	0.00	0.00

44 AIRLINE COMPOSITE  
47 SEP 500 COMPOSITE  
48 SEP 400 COMPOSITE

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DEVELOP A NORMATIVE OR DESCRIPTIVE MODEL OF THE  
INTERNATIONAL/DOMESTIC CIVIL AVIATION INDUSTRY VOLUME 3  
(U) SYNERGY INC WASHINGTON DC L H DYMOND ET AL

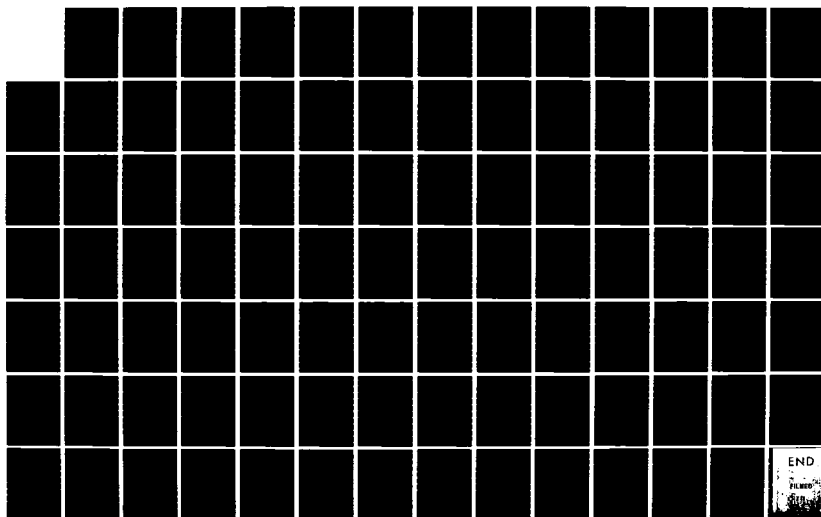
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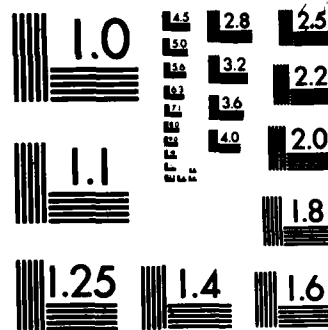
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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

APPENDIX IV-D

#### APPENDIX IV-D

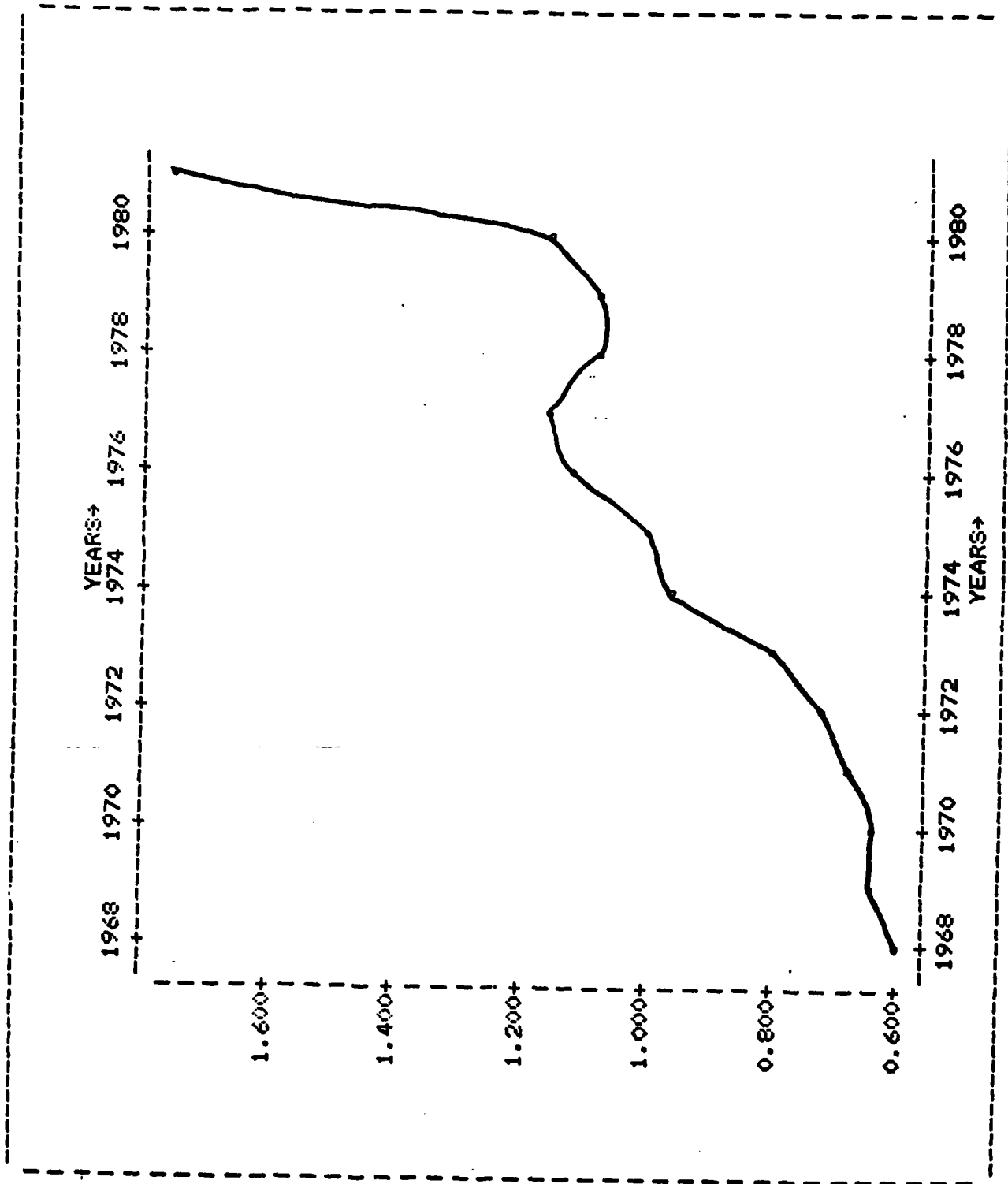
Figure IV-D-1 mirrors the increase in load factors, showing a large increase in asset turnover<sup>1</sup> by the airlines in recent years, particularly since 1978, when airline deregulation became effective.

While increased turnover could compensate for lower profit margins to bring higher profitability, Table 19 shows this has not been the case. The table shows the return on assets (ROA) for the airline industry as well as for groups within the industry and the market. It shows worsening profitability for the airlines from 1978 forward. An exception to this is the National carriers who have managed to maintain their level of profitability. However, the Majors, Regionals, and Cargos, as well as the industry in total, are all in distinctly worse positions in 1981 than in 1978. This contrasts sharply with the S&P 500. Only in the period 1976-1978 did the airlines as an industry provide a return very roughly comparable to the 500. Returns on assets for the Standard and Poor composite ranged from a low of 3.79 percent in 1975 to a high of 4.65 percent in 1979 -- the airline industry achieved a return on assets in excess of 3.79 percent (the S&P low) only in 1977 and 1978. The drop in returns experienced by the airlines since 1978 is not as severely reflected in the 500.

<sup>1</sup> Asset Turnover = Operating Revenue/Total Assets

FIGURE IV-D-1

Airline Industry: Profitability Measures, Asset Turnover



Source: I.P. Sharp

TABLE IV-D-1

Airline Industry Return on Assets, 1968 to 1981  
(Percent)

	<u>S&amp;P 500**</u>	<u>Airline Industry*</u>	<u>Majors*</u>	<u>Nationals*</u>	<u>Regionals*</u>	<u>Cargo*</u>
1968	N/A	1.6	2.5	(3.6)	6.3	(1.7)
1969	4.52	0.2	1.0	(4.7)	4.0	(1.7)
1970	3.85	(1.5)	(1.1)	(4.4)	(1.4)	(1.9)
1971	3.91	0.1	0.2	-	9.4	3.2
1972	4.00	1.4	1.5	5.1	4.9	6.4
1973	4.43	1.3	1.3	8.6	7.6	5.2
1974	4.23	2.2	1.9	5.4	32.9	1.8
1975	3.79	(0.4)	(0.7)	2.9	(6.1)	2.3
1976	4.29	3.3	3.3	5.2	(3.5)	4.1
1977	4.27	4.1	4.0	5.6	3.5	8.0
1978	4.36	5.8	5.9	4.4	2.5	5.5
1979	4.65	1.5	1.0	4.2	(1.1)	2.3
1980	4.25	0.1	(0.1)	1.9	(4.9)	(1.8)
1981	4.09	-	(0.9)	4.5	(4.4)	(1.1)

( ): Deficit

\* Source: I.P. Sharpe

\*\* Source: Compustat

APPENDIX IV-E

TABLE IV-E-1

## AIRLINE INDUSTRY

	<u>Funds From Operations As % Total Sources</u>	<u>Funds From Operations (\$ Millions)</u>	<u>Acquisition of Property and Equipment (\$ Millions)</u>	<u>New Investment As % of Total Assets</u>	<u>New Investment As % of Funds Operations</u>
1975	35.0 %	\$ 1,073.8	\$ 1,530.9	9.8 %	142.6 %
1976	49.8 %	\$ 1,664.9	\$ 1,095.5	6.9 %	65.8 %
1977	46.7 %	\$ 1,881.3	\$ 2,236.2	12.9 %	118.9 %
1978	44.9 %	\$ 2,692.2	\$ 3,551.4	16.6 %	131.9 %
1979	29.4 %	\$ 1,965.7	\$ 4,638.4	18.0 %	236.0 %
1980	22.7 %	\$ 1,842.9	\$ 6,042.9	20.9 %	327.9 %
1981 (3 Quarters)	31.8 %	\$ 1,730.7	\$ 3,132.8	16.3 %	181.0 %

Source: I.P. Sharp, C.A.B. Form 41.

TABLE IV-E-2

## MAJORS

	<u>Funds From Operations As % Total Sources</u>	<u>Funds From Operations (\$ Millions)</u>	<u>Acquisition of Property and Equipment (\$ Millions)</u>	<u>New Investment As % of Total Assets</u>	<u>New Investment As % of Funds Operations</u>
1975	35.6 %	\$ 942.51	\$ 1386.57	9.9 %	147.1 %
1976	55.0 %	1493.98	888.21	6.2 %	59.5 %
1977	49.0 %	1650.91	1911.50	12.3 %	115.8 %
1978	51.7 %	2364.91	2714.81	14.3 %	114.8 %
1979	31.3 %	1515.22	3481.89	16.0 %	229.8 %
1980	23.9 %	1416.06	4483.99	18.8 %	316.7 %
1981 (3 Quarters)	37.4 %	1387.41	2412.72	16.0 %	173.9 %

Source: I.P. Sharp, C.A.B. Form 41.

TABLE IV-E-3

## REGIONALS

	<u>Funds From Operations As % Total Sources</u>	<u>Funds From Operations (\$ Millions)</u>	<u>Acquisition of Property and Equipment (\$ Millions)</u>	<u>New Investment As % of Total Assets</u>	<u>New Investment As % of Funds Operations</u>
1975	6.7 %	0.96	6.32	23.8 %	658.3 %
1976	10.7 %	1.56	9.60	27.0 %	615.4 %
1977	6.3 %	10.41	17.17	26.1 %	164.9 %
1978	24.2 %	13.96	44.90	41.4 %	321.6 %
1979	26.5 %	27.75	73.36	31.0 %	264.4 %
1980	6.4 %	15.29	172.27	31.2 %	1,126.7 %
1981 (3 Quarters)	9.6 %	8.63	49.80	9.4 %	577.1 %

Source: I.P. Sharp, C.A.B. Form 41.

TABLE IV-E-4

## NATIONALS

	<u>Funds From Operations As % Total Sources</u>	<u>Funds From Operations (\$ Millions)</u>	<u>Acquisition of Property and Equipment (\$ Millions)</u>	<u>New Investment As % of Total Assets</u>	<u>New Investment As % of Funds Operations</u>
1975	41.5 %	\$ 116.91	118.65	30.3 %	101.5 %
1976	33.9 %	163.50	152.99	33.0 %	93.6 %
1977	38.7 %	197.63	254.25	53.0 %	128.6 %
1978	21.0 %	246.41	668.65	97.3 %	271.4 %
1979	25.6 %	383.96	956.89	95.5 %	249.2 %
1980	21.2 %	415.33	1362.29	115.7 %	328.0 %
1981 (3 Quarters)	20.4 %	334.63	670.29	55.0 %	200.3 %

Source: I.P. Sharp, C.A.B. Form 41.

TABLE IV-E-5

## CARGO

	<u>Funds From Operations As % Total Sources</u>	<u>Funds From Operations (\$ Millions)</u>	<u>Acquisition of Property and Equipment (\$ Millions)</u>	<u>New Investment As % of Total Assets</u>	<u>New Investment As % of Funds Operations</u>
1975	25.2	\$ 25.34	\$ 16.43	61.8 %	6,484 %
1976	23.5	54.87	59.32	166.7 %	10,811 %
1977	26.0	64.08	105.02	159.4 %	16,389 %
1978	27.4	122.06	208.33	191.9 %	17,068 %
1979	22.4	97.43	295.56	124.9 %	30,336 %
1980	15.6	122.70	675.74	122.6 %	55,073 %
1981 (3 Quarters)	25.6	14.27	34.65	6.5 %	24,282 %

Source: I.P. Sharp, C.A.B. Form 41.

TABLE IV-E-6

S&P 500

	<u>Funds From Operations As % Total Sources</u>	<u>Funds From Operations (\$ Millions)</u>	<u>Acquisition of Property and Equipment (\$ Millions)</u>	<u>New Investment As % of Total Assets</u>	<u>New Investment As % of Funds Operations</u>
1975	60 %	\$ 136,931.2	\$ 86,168.4	6 %	91 %
1976	70 %	\$ 159,600.4	\$ 91,825.6	6 %	82 %
1977	70 %	\$ 176,535.4	\$ 104,542.1	6 %	85 %
1978	71 %	\$ 200,000.8	\$ 122,013.9	6 %	86 %
1979	70 %	\$ 246,384.2	\$ 161,830.9	7 %	94 %
1980	67 %	\$ 211,207.4	\$ 186,028.9	8 %	99 %
1981	63 %	\$ 326,415.4	\$ 201,113.3	8 %	98 %

Source: Compustat

Source: I.P. Sharp, C.A.B. Form 41.

APPENDIX IV-F

#### APPENDIX IV-F

Invested capital in an enterprise is composed of all debt (short and long-term) and capitalized leases as well as all equity capital (common and preferred stock, capital surplus, and retained earnings). It represents that investment required to support or finance the asset base. The debt ratio measures the percentage of total funds provided by creditors and further describes the firm's financial structure. Table IV-F-1 compares debt to total invested capital for the S&P 500, the airline industry and carrier groups. Over time, the airlines have been 65%-75% financed by debt. The S&P 500 generally show lower levels of debt financing -- 60-69%. It is interesting to note that in the 1976-1978 period, the S&P composite group's debt to invested capital ratio exceeded that of the airline industry in total and each carrier group with the main exception of the Regionals. The increasing emphasis on debt financing in this period by the S&P group was first seen in the debt/equity comparison when the airline industry's ratio fell below that of the S&P 500 in 1977.

Long-term debt has generally provided at least half of total investment, as seen in Table IV-F-2. This contrasts with the S&P 500 which consistently, since 1972, show higher levels of long-term debt funding relative to invested capital. The Majors, accounting for most of the industry, set the trend with the Nationals closely following. The Cargo group appears more highly leveraged as do the Regionals since 1976.

The effect of the airline's debt burden can be measured by comparing debt service charges (interest) relative to earnings. The "times interest earned" ratio compares ordinary income<sup>1</sup> before interest and taxes to total interest

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<sup>1</sup> Income before taxes, gain or loss from discounted operations, and extraordinary items.

TABLE IV-F-1

## Percentage of Total Debt to Total Invested Capital

	<u>Regional</u>	<u>National</u>	<u>Majors</u>	<u>Cargo</u>	<u>Industry</u>	<u>S&amp;P 500</u>
1968	42.1%	81.4%	70.6%	75.9%	71.2%	N/A
1969	42.1	85.5	71.2	81.1	72.5	60
1970	40.1	86.3	74.2	78.9	75.3	61
1971	36.7	80.53	70.4	72.8	71.6	63
1972	42.6	76.6	70.2	69.1	71.1	64
1973	42.3	73.8	70.8	66.6	71.6	66
1974	64.4	69.0	70.5	69.5	70.3	68
1975	69.7	65.6	71.3	59.4	70.7	67
1976	72.5	61.6	68.9	60.2	63.3	67
1977	73.9	61.0	66.1	55.5	65.8	68
1978	81.8	69.7	66.5	66.1	66.9	69
1979	90.8	72.4	69.6	73.6	70.2	69
1980	87.8	75.3	73.1	75.9	73.7	69
1981, 3Q	79.2	68.2	76.2	73.7	74.8	69

Source: I.P. Sharp, C.A.B. Form 41.

TABLE IV-F-2

## Percentage of Long-Term Debt to Total Invested Capital

	<u>Regional</u>	<u>National</u>	<u>Majors</u>	<u>Cargo</u>	<u>Industry</u>	<u>S&amp;P 500</u>
1968	13.6%	58.3%	47.1%	54.4%	47.7%	N/A
1969	12.9	60.8	45.6	59.8	47.1	45%
1970	15.1	59.0	48.7	58.4	50.3	46
1971	12.1	56.2	44.9	54.5	46.8	48
1972	20.1	48.1	43.1	43.5	44.8	50
1973	26.2	42.3	41.9	37.7	42.9	51
1974	23.5	39.6	38.5	38.3	38.5	52
1975	28.5	35.5	38.4	27.6	38.1	52
1976	34.0	33.1	33.8	39.5	33.8	52
1977	34.8	32.4	29.8	33.0	30.3	52
1978	50.5	43.1	32.8	43.5	34.0	52
1979	55.4	45.4	34.3	48.0	36.2	52
1980	59.5	49.7	36.1	54.5	38.7	52
1981, 3Q	54.4	41.8	39.5	52.7	40.3	53

expense to indicate the safety margin of the fixed payments to lenders; the higher the ratio, the larger the safety margin. When the ratio is positive but falls below a value of 1, income before taxes is negative. Table IV-F-3 shows that for the airline industry, there was no safety margin in 1980 and 1981; this was the first time since 1970 that industry's earnings before taxes could not cover interest payments. This was the rule for all groups in 1980 and 1981 except the Nationals. In earlier years, some groups did far worse; where no value appears, the ratio had a negative value. The early years for the Nationals and Cargos showed no earnings power relative to interest, which is consistent with their very high levels of debt, as previously noted.

The sharp contrast between the S&P composite and any airline group is largely in the magnitude of the interest coverage measure. The upward or downward movement was relatively consistent between the two except in 1974, 1977 & 1978. Nonetheless, the market in general showed a far greater ability to service its debt even though, as previously noted, it had higher relative levels of long-term debt. The key factor then is earnings -- the S&P 500 showed a greater capacity for profitability over the 1969-1981 period as supported by healthier operating ratios and returns on assets.

One final look at solvency focuses on the short-term position -- the ability of the airlines to meet currently maturing obligations as indicated by the current ratio (Table IV-F-4). The industry's deterioration in liquidity began in 1979, although the Regionals have shown a poor current position since 1974 only in 1981. The S&P group generally followed the same trend of the airline industry, its current position was stronger. Over the 1969-1981 period, current assets exceeded current liabilities by half to three-quarters whereas the airlines; peak coverage exceeded current liabilities by about one-sixth in

TABLE IV-F-3

## Times Interest Earned

	<u>Regional</u>	<u>National</u>	<u>Majors</u>	<u>Cargo</u>	<u>Industry</u>	<u>S&amp;P 500</u>
1968	12.5%	N/A	3.1%	N/A	2.5%	N/A
1969	9.5	N/A	1.9	0.5	1.4	7.64%
1970	0.7	0.2%	0.3	1.0	0.1	5.65
1971	16.1	1.3	1.2	2.6	1.2	6.02
1972	6.0	3.1	2.1	4.5	2.1	6.43
1973	3.0	3.6	1.9	4.5	2.0	6.25
1974	1.2	4.0	2.1	1.8	2.2	5.65
1975	N/A	2.9	0.7	1.9	0.8	5.39
1976	0.1	4.6	2.6	3.6	2.6	6.02
1977	4.3	4.5	3.5	5.1	3.6	5.98
1978	2.6	3.0	3.7	3.2	3.6	5.64
1979	1.1	2.2	1.0	1.3	1.3	5.25
1980	0.1	1.5	0.6	0.2	0.8	4.25
1981	0.5	2.0	0.2	0.6	0.6	3.53

Times Interest Earned: earnings before interest and taxes + total interest expense.  
 1981 data includes quarters 1 through 3 only.  
 When no value is given, the ratio was not meaningful due to negative ebit.

Source: I.P. Sharp, C.A.B. Form 41.

TABLE IV-F-4

## Current Ratio

	<u>Regional</u>	<u>National</u>	<u>Majors</u>	<u>Cargo</u>	<u>Industry</u>	<u>S&amp;P 500</u>
1968	1.23%	0.97%	1.31%	1.15%	1.25%	N/A
1969	1.44	0.94	1.15	1.29	1.11	1.75%
1970	1.50	.91	1.10	1.31	1.07	1.69
1971	2.03	1.04	1.19	1.67	1.16	1.73
1972	0.84	1.14	1.10	1.57	1.12	1.76
1973	1.19	1.16	1.16	1.56	1.16	1.69
1974	0.84	1.17	1.09	1.44	1.09	1.60
1975	0.82	1.25	1.12	1.72	1.12	1.67
1976	0.87	1.26	1.17	1.78	1.18	1.69
1977	0.76	1.24	1.16	1.72	1.17	1.65
1978	0.77	1.07	1.05	1.47	1.05	1.58
1979	0.77	1.04	.92	0.96	0.93	1.50
1980	0.85	0.87	.86	0.94	0.86	1.46
1981, 3Q	1.11	0.86	.63	0.91	0.78	1.44

Current Ratio: Current Assets ÷ Current Liabilities

Source: I.P. Sharp, C.A.B. Form 41.

the mid 1970s. Since 1979, airline industry current assets fell below current liabilities while the S&P groups' are in excess. Both groups' current ratios have been declining since 1976. The current ratio is not a perfect measure as it neither measures the actual flow of funds nor does it distinguish liquid from illiquid assets. It does, however, give an indication of the ability to fund operations.

APPENDIX V  
FINANCING AIRCRAFT

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## V-A. LENDERS' CRITERIA

### A. Bank

Different criteria are applied for evaluating financings for each of the two main classes of airlines: flag carriers and others. Flag carriers are those which are engaged in international aviation and are owned -- at least in substantial part -- by their respective governments. In this sense, Pan American is not a flag carrier. For purposes of this discussion, only U.S. carriers will be considered with respect to the criteria used in evaluating how an institution, specifically Morgan Guaranty Trust Company, would evaluate financing for the airlines.

#### 1. Events that Influence Lenders

Three events have largely influenced the financing opportunities for the domestic airline industry. These are deregulation, the Air Traffic Controllers' Strike, and the current economic environment. Gernot Reiners of Morgan Guaranty compares airlines under regulation to a utility or the railroads: largely mediocre companies earning an inferior rate of return and, largely as a result of inflation, slowly deteriorating balance sheets. Airlines were a relatively safe risk because they had something of value -- their franchise or route structure. If they got into serious trouble, there was always a competitor anxious to take them over in order to acquire the network. With deregulation the value of the route structure was wiped out and any incentive to acquire the heavy debt burden of a troubled carrier disappeared.

Deregulation should have a healthy effect on the U.S. airline industry as well as the lending practices with respect to that industry. Getting there

will take a long time and may eliminate up to three major U.S. carriers (with all the hardships entailed for employees, investors, and lenders), according to Gernot Reiners of Morgan Guaranty Trust Company. But because the stakes are so high, the process will drag out longer than it should resulting in an impact more severe than need be. Banks do not like to write off loans. To avoid this, they will restructure and reduce interest rates on troubled loans drastically. While this worked for real estate loans in 1974-75, the effect that soaring inflation played on bailing out these loans will probably not occur for the airlines in the 1980s. No financial institution likes to pull the plug on bad loans because of the pressures from other major lenders, manufacturers, and the fact that it is tantamount to the lender's admission of having made a mistake.

The effect of restructuring loans for an individual company (changing the schedule of principal payments and interest rates) distorts the operating environment of the industry. For example, if Carrier A does not have to meet scheduled principal repayments, interest costs are reduced. The cost of the product -- seat miles -- drops. To sell more product, Carrier A cuts prices. Carrier B, in order to help market share, matches the price of Carrier A, but Carrier B does so without the benefit of "subsidy" from its lenders. Carrier B which is only marginally profitable begins losing money and its financial position deteriorates.

The Air Traffic Controller Strike will have positive implications for the industry in that it: injected a dose of realism into airline labor unions, made obvious that the U.S. airlines, operating at 75 percent capacity, can accommodate demand for air travel. Such indications of overcapacity, irrespective of the current recession, lends doubt to optimistic estimates of

demand for new aircraft in the next decade, even before addressing the financing issue.

The situation created by the PATCO strike and deregulation and aggravated by economic environment provide a scenario with which to approach financing opportunities.

## 2. Financial Position

The first thing to evaluate is the airlines' current financial position: earnings, balance sheet, and cash flow as well as an assessment of the air fleet, capitalized lease obligations, and other major assets. Although earnings fluctuate wildly, the airlines' cash flow tends to be relatively stable. The ability, historical and projected, of the carrier to self-finance its equipment needs is important. Morgan Guaranty puts little weight on airlines' earnings projections because any forecast beyond the next three months is highly conjectural. Instead, fleet expansion programs and business strategies are important elements in the lending decision.

## 3. Route Analysis

Since deregulation, route analysis has become a very important factor, not in terms of where the airline flies, but in terms of how much traffic it controls on its various routes and how well it has developed its hub and spoke system. Route analysis permits an assessment of the strength of the system and possible effect of competition. As a general rule, routes going into the hub and routes where the airlines control a substantial percentage of total traffic are much less vulnerable to competition than other routes because of the high cost of entry. The better developed the hub system and the higher the percentage of controlled routes, the less vulnerable a carrier is.

#### 4. Equipment

Much attention was given to the relative efficiency of the lift capacity of an airline, i.e., how modern its fleet is. The trouble with this analysis is that old aircraft may be fully depreciated and may have residual value while modern aircraft require high debt service payments. Rankings were made for the average of each fleet. In 1978, Braniff and Continental had the most modern fleets in the industry and TWA and American had the oldest and least efficient fleets. Then came the Air Controller Strike. American and TWA grounded their inefficient planes which carried little holding cost, while competition with the more modern fleet ran into debt service problems.

This is not to say that a modern and fuel-efficient fleet will not pay off over time. But over a few years other factors may be more relevant. An efficient but costly fleet is good only if a carrier has the financial resources to support it until the fleet pays off.

A great deal of attention is paid to the type of equipment being financed. First, it is necessary to ascertain where the equipment is in the industry cycle. Lending 80 percent of market value at the bottom or beginning of the cycle may be prudent while lending 50 percent cent at the top may be folly. In 1978, for example, a bank would have been very reluctant to lend more than 50 percent of market value; today, it might be willing to go considerably higher. Next, look at the life cycle of the type of aircraft to be financed. One should not rely heavily on the resale value of equipment which is just being introduced to the market place or equipment which has been surpassed by technological developments or is going out of production. In this sense, the Boeing 747, the Airbus and the DC 9-80 are favored by Morgan Guaranty while the Boeing 737 in the intermediate term (up to ten years) is still

acceptable; a rather dim view is taken of the Boeing 727 and the Lockheed L 1011. Morgan Guaranty still reserves judgment on the Boeing 757 but considers the Boeing 767 excellent collateral from the beginning since it is not a truly new-generation aircraft compared to the 747 or the A-300 when they were first introduced.

## 5. Conclusion

Airline financial position, route structure, and equipment analysis are the main criteria considered when making aircraft loans. Suggestions could be made to airline management to make airline financing more attractive.

Ideally, a lender such as Morgan Guaranty would like to finance the company rather than a specific piece of equipment. If all aircraft -- the main assets of most airlines -- are encumbered, it is very difficult to finance working capital and downpayments. Air Canada appears to be the only airline which is not borrowing on a secured basis and it is a flag carrier. Airline management appears to be more concerned with market share than return on investment. This philosophy is not conducive to improving profitability or attracting long-term financing. Until the airlines "self-regulate" to reduce redundant route service, their access to the capital markets will be constrained.

## B. Lessors

From the point of view of lessors, specifically GATX Leasing, various factors influence the market for leased aircraft. Above all else, the credit risk of the lessee is the most important evaluation criteria. However, other factors come to play in asset consideration which are not unlike those of a bank providing purchase financing. These criteria include risk, asset or aircraft valuation, and fleet management.

## 1. Risk

Risk is evaluated in terms of the operator's (lessee's) credit risk and the lessor's recovery risk. The operator of the leased aircraft may be protected by law from repossession, even in the event of default. Furthermore, the delay in repossessing the aircraft or recovering defaulted lease payments may be exhaustive.

## 2. Aircraft

Numerous considerations are given to aircraft evaluation. Specifically, these are: aircraft popularity, manufacturer support, obsolescence, production cycle, configuration, market potential and financing. The aircraft lessor must take this multi-dimensional view of the aircraft because he is the ultimate owner of the and must protect his investment.

Popular aircraft present a more attractive option for leasing than unpopular aircraft. The reason is clear -- at the end of a lease term it is easier to find other operators for that aircraft.

Manufacturer support is an important element in the lessor's evaluation. Aircraft are long lived assets; if the manufacturer may not be around in 10 to 15 years to provide maintenance or spare parts, the value of the asset diminishes. The manufacturer's introduction of new generation aircraft also detracts from the current generation's value: while a 727 is still viable, it is being replaced by the 757 and its value suffers as a result.

Obsolescence affects aircraft in a variety of ways: through evolution of design improvements, technology, competition and general design. Improved design aircraft (e.g., 727-200 is an "improved" 727-100) are more attractive to investors than the earlier models. Technology improvements rendered the 707 and DC-8 non-fan jets obsolete. Competition from expected new equipment,

not yet on-the-shelf, could ruin the value of leased aircraft -- by offering an improved design or a major technological improvement.

The overall design of an aircraft should determine its intended use. If the plane's limitations are not considered in its usage, the aircraft's value may be made vulnerable to deterioration.

Regarding the stage of the production cycle, lessors want to invest early yet also within three to four years into the aircraft's production cycle unless strong factors arise to influence a favorable decision. These factors include shorter terms of the lease, high rate of return to the lessor, etc.

The aircraft's configuration also plays an important role in the lease evaluation. Although aircraft have standard designs, customizing to the buyer's peculiar requirements limits and often reduces resaleability of aircraft.

If the aircraft has a worldwide market potential, it is a better risk (e.g., DC-9-30, 727-200, 737-200) than those aircraft facing only a domestic market (e.g., DC-10-10, L-1011-1) or a world market exclusive of U.S. (e.g., DC-10-30, 747-200). Specialized markets are seen as risky investments.

Financing availability is deemed a poor single reason for selecting an aircraft for leasing/investment.

### 3. Fleet or Portfolio Management

There are portfolio effects even in airline leasing. The lessor wants to limit investment in any one aircraft type but diversify within that type: e.g., concentrate on twin-engine types but diversify among different twin engine types, such as the 737, DC-9, Airbus, etc.

Further, the lessor must consider the maturity schedule of his aircraft out on lease. The objective is to spread out the maturities over time to

minimize fluctuations in the market. The maturities should also be less than the useful life of the aircraft.

However, the lessor will want to arrange the lease periods of the same aircraft to coincide. The rationale is that single planes are difficult to move but a fleet is attractive to operators. There is one possible exception to this rule-of-thumb -- wide bodies.

#### 4. Current Market Selections

In light of these criteria, Douglas Kay outlined GATX Leasing's current market selection of aircraft for the most desirable planes in the 1980s:

##### a. Boeing

1. 737-200 -- The 737-200 (Advanced) is still the hot seller. Are new ones a good investment at \$13-15 million? It is a good candidate for short-term loan at 75 percent advance rate, but not for long-term equipment investment. Not likely that the value will hold seven to fifteen years from now.
2. 737-300 -- Too early to tell. It may be a sleeper (as was 737-200) but the prediction is it will not be a big seller.
3. 727-200 -- Even with fuel cost stabilized, this will eventually become a drag on the market. New ones (e.g., Republic) are already hard to move. Old ones are also not selling well. If re-engining takes place, then re-engined aircraft may be a fine five to eight year investment.
4. 757-200 -- Very impressive economics on certain routes but so far not a popular aircraft. It is too expensive as a replacement for the 727-200 until fuel costs go up. If the 727-200 is re-engined the 757 may be a dead duck.
5. 767-200 -- Most attractive of Boeing line, but very expensive. Market may be limited to North America. It will have to prove itself in service to attract new customers and investor confidence. Still the best bet in the Boeing twin-engine group.
6. 747 -- Great financing opportunity for international consortia and lessors with national loyalty, but too much money for the average lessor.

b. Airbus

1. A300 -- Fine aircraft. GATX would not buy new in the current market because of future saturation.
2. A310 -- On a world market basis it looks better than the 767, but it's too early to tell. It is important not to under-estimate Boeing in the long run. This is GATX's first choice for long-term investment value if buying today. A problem is that sales so far have all been outside U.S., so no chance to get fair market value.

c. McDonnell-Douglas -- The question is whether McDonnell-Douglas will continue to commit to the commercial aircraft market in face of reduced sales.

1. DC-9-80 -- It is the 150-passenger aircraft and the replacement for the 727-200. Obviously not many others think so. Still, it's GATX's second choice for long-term investments.
2. DC-10 -- Current-10 is probably at the end of production. Super-10 may be viable as trans-Atlantic aircraft. The 30 is a classic example of lack of popularity. Maybe someday good sense will return to the market, but until then new ones do not look like a good investment. Used 30s may be the best speculative investment of all if you think common sense will eventually prevail.

d. Others -- There are no others according to Mr. Kay.

V-B. THE OUTLOOK FOR NEW AIRLINE EQUITIES:  
PROJECTIONS FOR 1982 AND BEYOND

Profits are the central issue for the airlines. The critical condition of several airlines is shown in their recent wholesale disposal of assets, refusal of aircraft deliveries, forgiveness of interest owed by them to banks, and qualified 1981 financial statements (for four of the twelve majors).

At the same time, the industry has shown an enormous capacity to survive. Lenders, labor, and management have made significant sacrifices. Julius Maldutis of Salomon Brothers believes that any failure will not come about due to lack of commitment from any one of those three. Rather, failure will come from the travel agent seeking to protect the customer from the very thing he is seeking to avoid. A travel agent typically books 50-60 percent of an airline's passengers. Slight diversion can produce a dramatic and disastrous change in cash flow. If one major U.S. airline folds, Mr. Maldutis predicts that it will be followed by several others in quick succession. Further, he projects:

- The second half of 1982 should show some expansion in economic activity which, when coupled with federal income tax cuts, could provide strength in air travel.
- First quarter traffic growth of 4.1 percent for the majors and 18.4 percent for Nationals shows some surfacing of deferred demand. Combined with strong advance international bookings may reflect a fundamental turnaround in air travel in 1982 (although booking data for domestic U.S. travel are no longer as reliable as in the past).
- Price-war mania appears to be ending at least temporarily. This would result in significant yield improvement estimated to occur in the third quarter.
- Costs tend to follow prices -- sharply reduced fares have prompted management, particularly of the large carriers, to extract wage and work rule concessions from labor and trim management staff. Even

larger concessions will be obtained from labor if a major suffers financial collapse.

- Following first quarter results which showed sharp increases in losses, the second quarter will show some improvement but still marked by unacceptable losses for the majors and declining profits for the smaller carriers.
- 1982 has all the characteristics of a transition year for U.S. airlines: a profit of \$240 million for majors versus \$614 million loss in 1981. A slight change in traffic, fuel prices, or resumption in marginal cost pricing could destroy the projection; similarly, a slight deviation in the project of economic recovery could produce near-fatal results for some airlines.

Beyond 1982, Maldutis observes:

- When pent-up demand surfaces (44 million passenger trips deferred over the last two years, as measured by difference in trips in 1979 and actual trips made in 1980 and 1981) it could provide explosive earnings gains just as its disappearance provided a decompression.
- The lessons of labor excesses over the last two decades will permit management to maintain better cost control in the future.
- Reduction in the size and depth of discounts and across-the-board price increases will show significant yield improvements.
- Earnings of \$1 billion or more are not only a possibility but a must in order to support the capital needs to replace obsolete aircraft and meet demand for future growth. By year end 1981, the majors operated 2,005 aircraft of which 26 percent, or 524, were economically obsolete.
- Airline deregulation had one virtue -- it limited the uncertainty surrounding aircraft acquisitions. We are now beginning to see the most important aspect of airline deregulation in the decision-making process for ordering and committing new aircraft purchases. The decision-making will be based less on the marketing aspects and more on bottom-line criteria. Thus, recovery and airline orders will be gradual and should become visible during the second half of 1983 -- assuming the expected profit recovery is not aborted. Also, differences among airlines aircraft strategies will emerge as large carriers become increasingly specialized.
- Some trial balloons have been sent up regarding re-regulation of the airline industry, leading us to expect some members of Congress and the CAB to attempt re-regulation or recapture of CAB powers, especially in the event of a major airline insolvency.

-- Washington appears to exhibit a new sense of awareness for accommodation rather than confrontation in the international sphere. An equilibrium between the country's civil aviation needs and the passengers' need for lower fares and financial solvency is more apparent.

Given these factors of influence for 1982 and beyond with the knowledge that the airlines above all need to begin making a profit, is it possible for the airlines to increase their equity base as a source of capital as so many industry experts appear to be saying? To understand the situation that the airlines face in the equity markets, a few facts are in order. First, airline stocks have historically shown far greater volatility than the equity markets as a whole. For example, in 1978 the S&P 400 Stock Price Index showed an average variation of fourteen percent. The S&P Airline Stock Price Index had an average variation of 36 percent -- more than twice as much as the market as a whole. Analysis of almost a decade of stock price movements reflects similar patterns.

Second, despite the poor first-quarter 1982 financial results, airline stocks, as measured by the S&P Airline Index, rose 32 percent. This seemingly irrational behavior is nevertheless quite consistent with the following facts: airline equities respond to current and projected traffic developments. Thus, the rise in traffic during the first quarter, coupled with even better results expected for the summer, has been reflected in share prices. Airline equities trade on current and expected traffic trends since they are a good surrogate for earnings. Small changes in traffic result in disproportionately large changes in operating profits. It is not surprising that airline equities are so volatile. If the expected traffic recovery for the summer does not materialize, airline equities will sell off sharply.

Third, Delta is the only airline today selling above book value;

illustrating the market's general disillusionment with the lack of earnings and dividends. This very forcefully underlines the need for earnings and dividends.

Fourth, in 1981, an abysmal year for airline profits, some \$340 million in equities were issued. From April, 1980 through May, 1981 airline equities rose 104 percent in response to expected second-half traffic and earnings recovery, but when the expectation went unfulfilled, airline stock prices plunged. Nevertheless, it was possible to tap the equity market.

Fifth, given present trends and expected second-half earnings, prospects for 1983 remain strong. It will be possible for some airlines to sell equity.

## V-C. PRECONDITIONS OF PROFITABILITY

If profitability is the key factor in the financing of new aircraft, then it follows that the conditions for profitability must be examined. These are, according to Knut Hammar skjöld of the International Air Transport Association:

- an end to the current recessionary cycle and high inflation
- higher disposable incomes
- lower interest charges
- stability in currency exchange rates and fuel prices
- and, in the sector of international aviation, a world-wide pattern of reasonably compatible and common-sense national aviation policies

One thing the airlines must do is exercise caution and prudence in their financial affairs under the extreme uncertainty of today's environment. That means ensuring sufficient profitability to cover interest charges, and provide a reasonable return while at the same time generating sufficient internal funds to maintain an acceptable debt/equity ratio -- ideally 50/50 but no worse than 60/40. The Laker Airways case is a classic illustration: Laker might still be flying if some equity participation was allowed before embarking on rapid expansion in 1978.

Laker was not alone in failing to provide a cushion against adversity. Some of the world's long-established and hitherto successful airlines carry heavy debt loads with virtually no salable assets given the depressed used-aircraft market. Kept alive by monetary infusions from banks and other lenders, a nightmare would ensue for the ailing airlines if, come the upswing and a renewed demand for aircraft, the lenders refused to provide more capital before the industry recovered.

The three things airlines must do to improve their finances while maintaining an efficient and safe fleet are:

- cut costs
- improve yields, and
- trim capacity to market needs.

The airlines are buckling down to these tasks as borne out in almost daily news of staff lay-offs, wage freezes or reductions, and cancellations or postponements of new aircraft orders. The dilemma arising out of these actions is whether the airlines extend themselves in pursuit of financing the new more cost-efficient aircraft or cancel these orders.

Despite the growing uncertainties, the industry is forced to make projections of aircraft requirements in order to cope with the manufacturer's lead times and to plan its finances. IATA has just completed a comprehensive study of its member airlines' needs and sources of capital from 1981 to 1990. In view of the disastrous financial results of the past two years, airlines have recently delayed ordering new airplanes and cancelled options for deliveries down-line: they have all been reassessing their long-term investment plans.

Within the reassessment, airlines are looking at two components of aircraft requirements: replacement and growth. Growth may or may not happen. But the need for replacement will not simply go away.

The assumptions and findings of IATA's study concludes that the external financial requirements for IATA airlines during the decade will range from a minimum of 90 billion dollars to a maximum of 139 billion dollars (in 1981 dollars). Allowing for inflation, the actual totals will be considerably higher.

Taking the most probable traffic growth scenario -- an annual increase of five percent -- the financial requirement for growth works out to \$104.8 billion (1981 dollars). This breaks down to \$87.3 billion for aircraft and spares plus \$17.5 billion for other fixed assets. If traffic grew by only four percent per annum during the 80's, then the new capital requirement is some \$90 billion at 1981 prices, of which \$50 billion of that is needed to replace old aircraft.

The unavoidable replacement requirement for the 1980s is estimated at \$50 billion dollars at 1981 prices. That can be modified to cope with the current adverse financial situation. It can "spill over" for a couple of years beyond 1990, but it cannot be ignored. Even if there is zero traffic growth during the 1980's, there is that irreducible minimum of capital investment -- \$50 billion.

In arriving at the total capital requirements IATA took into account the airlines' need for different categories of aircraft, from long-range wide bodies through smaller propeller types. It was found that peaks will occur in 1985 and 1989-1990. There is likely to be a heavy retirement of existing long-range narrow-bodied aircraft in 1985. And in 1989-90 the oldest of the long-range wide bodies will be reaching the end of their working lives.

In financial terms this means, first and foremost, there is no substitute for profit. If airlines are profitable, they will have no trouble raising the money they need for new aircraft. If unprofitable, they will have great difficulty. For the most probable five-percent per annum traffic-growth scenario, the IATA study reaches the overall conclusion that the need is for a minimum profit: 7.5 to ten percent of capital, depending on rate of tax. And this is needed in each of the years 1981 through 1990.

Even if there were to be no significant traffic growth during the 1980's, even if the airlines had merely to replace their obsolescent assets, then the profitability requirement, on a much reduced revenue base, would still be on the order of six to seven percent, assuming that the airlines maintained a cautious and prudent attitude toward their finances.

Financial experts are working on new and innovative concepts of aircraft financing. But the concepts can only serve as bridging mechanisms to a more profitable future. Various alternatives to profitability at the six to eight-percent level have been proposed. Although it has been suggested that the airlines could try more extensive leasing arrangements, or longer pay-back periods for their loans, the IATA study found them not to make any significant difference in the required rate of profitability. It all comes back to that one concept -- profitability.

In fact, the airlines will have to become much more profitable during the 80's than they were in the 70s. In the past decade, airlines' average rate of profitability was only 2.7 percent; in terms of an average gross return on assets, that figure represents about five to seven percent. It is interesting to note that a recent CAB study has come up with similar figures for IATA members on the North Atlantic in the 1970's. Their conclusion is also no surprise: the airlines' rates of return will have to rise substantially before they can expect normal access to funds.

The airlines were able to grow in the 70's because of special circumstances:

- They did not need to replace many of their airplanes.
- This encouraged them to spend their depreciation allowances on expansion rather than eventual replacement.
- The world's financial institutions, flush with recycled oil money, were lining up to lend to the airlines. No one seemed to mind about

any high "gearing" -- debt/equity -- that resulted. The second-hand value of airplanes was increasingly handsome.

- Average break-even load factors were below 50 percent at the start of the 70s. There was plenty of room for upward movement in load factors in general.

For the 1980's, a profitable airline industry is essential:

- The need for replacement aircraft will not go away and it can only be delayed for one or two years.
- Depreciation reserves have already been used in the euphoric expansion of the 70s.
- The world's financial institutions have many claims on their lending capabilities not least of which are the massive government deficits in many countries.
- Average break-even weight load factors are now pushing 60 percent, with passenger load factors at 65 percent -- and that is very high as a year-round average. So there is limited scope for using assets more intensively.

What are the chances for a profitable airline industry? At the carrier level, the Chief Executive of American Airlines stated that unless his new investment in airplanes was likely to result in at least a five-percent rate of profitability on revenue, he would seek alternative investments.

At the industry level, profitability depends upon charging sensible fares and rates that are properly related to costs.

The airlines failure to achieve the required profitability levels depends to a large degree on whether an airline functions purely as a commercial entity or as a subsidized public service. Mr. Hammarskjöld describes it as a "sink-or-swim situation in which the outcome will depend entirely on each individual airline's ability to keep its head above water. This is a fight for survival in which only the fittest will survive: those who clearly recognize that there is no substitute for profit."

#### V-D. PREPARING FOR THE FUTURE

The financial profile in 1980 for the world's scheduled airlines was marked by:

- Capitalization of 60 percent debt and 40 percent equity which totalled \$60 billion.
- Interest expense of about 3 percent of average revenues, or \$2.5-\$3.0 billion on \$90 billion of revenues.
- Net losses amounting to 4 percent of revenues, or \$3.25-\$3.75 billion

Actual losses published may show lower amounts, in most cases obscured by one-time benefits in sale of assets, retirement of low-cost debt, tax benefits, etc. Interest charges on average debt reveal an average interest rate between seven and 8.3 percent; ATA pegs this rate closer to 8.75 percent for U.S. carriers in 1980. Both of these rates are well below 1980 market rates but can be explained by the heavy influence of old debt at lower rates and the rate advantages of newer debt instruments. What is important for the future is whether these rates will be available in the future and whether financing with tax benefit transfers will also be available. Further, the time lag effect should work to a disadvantage in the future with maturing old debt being replaced by more expensive new debt.

Emile Beekman of KLM Royal Dutch Airlines predicts that these interest rates will be of predominant importance over the next ten years. Present estimates for airline investment in the 1982-1991 decade are close to \$200 billion (1981 dollars). Because present cash flows barely meet currently maturing debt and thus do not encourage new equity investment, loans and leases are the only current alternative for equipment financing. These equipment needs are based on a 5-6 percent traffic growth rate, a slight load factor improvement, and a replacement assumption of 40 percent of the present

fleet over the next decade (1,750 replacements).

If growth is downgraded, then capacity estimates will change, especially in view of the capacity overhang. Currently, it is estimated that between 100 and 125 wide bodies and about 450 narrow bodies comprise the overhang of the entire world scheduled airlines. With continued low growth rates, this unused capacity could satisfy four years growth. Overhang implies a reduction in new orders, not an end to new orders; some planes are so old that they will be retired while others will be sold to non-scheduled airlines. Overhang may also force down the price of new planes: even with the higher operational cost of old equipment, the low price and lower financing cost of used equipment could put the buyers in a very competitive position.

Nevertheless, investment estimates must be reduced. Unless airline profitability improves, financing even these investments may be impossible.

To prepare for the future, airlines must first correct the mistakes of the past. Mr. Beekman suggested some of the changes that must occur:

- Include interest cost in cost accounting as well as in pricing.
- Pass inflationary cost increases on to the customer.
- Limit the customer's benefits of productivity gains.
- Study capital turnover and its relationship to load factors, yield and asset utilization as an indicator for efficient capital employment (Mr. Beekman stated that a profit requirement of 7.5 percent of revenue is required to maintain a debt/equity ratio of 60/40 according to IATA studies for 1981-1991. Further, he estimated that given an interest rate of ten percent and a capital turnover rate of 1.6 times, this 7.5 percent return on revenues implies a twelve % return on capital).
- Check labor and marketing ambitions for financial possibilities.

In sum, airlines need astronomical profits for financing in the coming decade. To obtain debt financing, the industry needs to bolster its equity base which in turn can only be done by generating profits.

## V-E. LEASING: TAX AND ACCOUNTING ASPECTS

Accounting policies relating to leasing reflect huge uncertainties. The major issue is whether or not safe-harbor leasing as it now exists will continue. It must be kept in mind that there has always been and most likely will always be leasing which allows some form of tax benefit transfer. What remains in question is the price and the manner in which the transfer will be executed. Confusion and conflict arise because the economics of lease transactions are not well understood. The central point is value: the value of rents, the value of tax attributes, and the value of residuals.

In any environment, and especially under safe-harbor rules, it is at best difficult to value current and future tax benefits whether they be in the form of write-offs, credits, or tax deferrals. Similarly, the value of the property being leased comes into question when one tries to determine the future or residual value at the end of the lease term. The price of the lease or the rents reflects the residuals and the estimated tax benefits. Thus, leases are largely structured on tax rules affecting cash flows and timing. Considerations other than cash flow can also affect the lease terms: e.g., how the lease will be reported in the firm's financial statements. Thus, accounting rules often change the economics of a lease structure when a benefit accrues merely from accounting principles. Above all, it should be remembered that the terms and conditions will be tailor made for both the buyer and the seller to achieve maximum effectiveness in the lease arrangement.

Essentially, all that safe harbor accomplished was to change the timing of tax benefits and not the amounts. The element of transferability already existed in older lease concepts. By relaxing the ownership criteria, emphasis

was switched from residual or asset value (at the end of the lease term) to tax benefit value and rent value. The current controversy in leasing largely centers on the value of tax attributes and effective asset ownership.

Reflecting the confusion of safe-harbor leasing is the attitude of the tax-paying public towards safe harbor. Even in the airline industry, some propose that they cannot survive without it (e.g., Eastern) while others (e.g., Continental) urge that safe harbor be rescinded. The reason for this difference of opinion is rooted in each airline's ability to make effective use of the safe-harbor rules to give them a competitive advantage.

A great deal of attention should not be devoted to safe-harbor leasing at this time. It is not likely that safe harbor will survive in its present form. It will most likely survive in changed form, according to Herbert Huene of Coopers & Lybrand: Mr. Huene's opinion that although the present law works reasonably well in achieving its purposes, it is perceived as corporate welfare, an abusive tax-shelter device, or a tax-avoidance technique. Thus, changes to safe harbor are a political reality -- the question is how:

1. Timing: complete repeal is unlikely as is the proposed repeal retroactive to February 19. A probable effective date at enactment is likely.
2. Leave safe harbor relatively untouched: almost certain for repeal is the \$1 purchase option at the end of the lease. The introduction of a corporate minimum tax (not only for those in leasing arrangements), as proposed by the Administration, is at best an unrealistic tax concept but has political appeal. The problem is that added tax cost will be passed down through leases and ultimately to the customer. Another alternative is the Durenberger/Walker proposal which limits the use and risk of tax benefit transfer leasing. The leasing industry proposes to return to traditional structures of leveraged financing and operating leases.

In the final analysis, the issue centers on defining an acceptable and true owner of the property and tax benefits. Given the uncertainties that now

exist as to the value and owner, the current leasing environment may be one in which there is a cost associated with the risk and uncertainty. If the ownership issue is resolved and accepted, future leasing may be lower priced.

Accounting rules for safe harbor leasing are in reality little changed from prior rules (FASB 13). Proposed accounting rules for safe harbor would apply only to the \$1-purchase option and then, only after the effective date of the standard which could be in the fall of 1982. Even with the future safe harbor in question, the accounting rules of importance remain virtually unchanged at this time.

#### V-F. NEW FINANCING TECHNIQUES: AN EXAMPLE -- AMERICAN AIRLINES

Airlines now face vastly different capital markets. What was once almost the exclusive territory of banks and insurance companies, airline capital is now nearly all obtained from other sources. Most banks' credit committees will not approve new loans bearing an airline name; those that do lend to airlines are highly selective, preferring those airlines perceived as the survivors. The insurance companies, set back in their long-term lending because of inability to sell whole life insurance policies, are also diverting what is left of their long-term funds into real estate and equity investments. The resulting prospects differ for the domestic carriers. Basically, U.S. airlines can be grouped as bankable or unbankable credits. Unbankable credits will have to improve their profitability before attracting outside money. Bankable or lendable airlines are finding themselves in a new financial environment requiring innovative financing mechanisms that open up new markets not already saturated with airline debt.

American Airlines (AA) adapted to this environment by developing a strategy aimed at diversification of capital sources, but only to an extent in which some alternative will always be available. Thus AA has pursued novel but complicated financings because no practical alternative existed. The new financing schemes frequently offered considerable savings as compared to traditional sources, assuming they were available.

American Airlines views the universe of capital markets as made up of four entities:

1. Commercial banks
2. Non-bank international institutions
3. U.S. private lenders
4. U.S. public market

Traditional floating rate bank debt is no longer an answer to airline capital requirements even if it is available. The reason for this is that borrowing short-term to fund long-term assets results in mismatched cash flows. In relation to the cyclical airline industry, high interest rates usually occur in a poor operating environment. The airlines' recent experience shows that the increased cash outflows required to service floating rate debt occur at those times when they can least afford it. Future capital needs for the industry will thus be asset based rather than working capital based.

This is not to say that floating rate debt will no longer be used. It still provides bridge financing -- those funds needed until attractive long-term, hopefully fixed rate debt becomes available, usually to wait out a bad fixed-rate debt market. Bridge loans have the characteristics of borrowing long-term at short-term rates with provisions for take out if the borrower obtains long-term fixed rate debt. Bridge loans can be tailored to avoid cash flow volatility inherent in floating rate loans. American Airlines arranged a floating rate bridge loan in which interest at a specified rate was payable in cash and any interest over that specified rate (due to rate fluctuations in the market) accrued and became payable at a specified future date.

The Euromarkets were tapped by a U.S. airline (American Airlines) for the first time in 1981 by American Airlines. Traditionally, airlines find it difficult to borrow in Euromarkets for term and credit reasons. Euromarket long-term financing is generally five to ten years, about equivalent to the life of some used aircraft. When American Airlines went to the Euromarket, it was to finance the purchase of eight to ten year old Braniff 727-200s. Further, Euromarkets require ratings of Baa or better with secured loans (via

aircraft) almost an unheard of event. Further, by adding warrants to the original Eurobond offering allowing investors to purchase another bond at the same rate (attractive to those investing long-term who anticipate those long-term rates to slide), AA bonds could compete with higher quality issues, reducing the interest rate by one-half of one percent and lowering the placement cost if the warrants were exercised.

Another example of international participation was a dual currency eight-year Swiss private placement loan. The advantage of such currency plays is to effectively reduce costs. Here, interest payments were denominated in Swiss francs which, when hedged, fixed the dollar cost; principal payments were denominated in U.S. dollars, but principal increased annually by a rate of 7 5/8%, to compensate Swiss investors for bearing the exchange risk). At closing, American Airlines received loan money in Swiss francs. Thus, American Airlines managed not only to avoid U.S. capital markets, but dollar-denominated markets as well.

U.S. private and public markets are expensive for a Baa-rated airline. American Airlines developed a strategy to operate in those markets but at a lower cost by separating the provider of funds (lender) from buyer of the credit risk (essentially, a guarantor). Generally this is accomplished through bank support via a letter of credit, the cost of which is approximately the same as the rate savings from the quality spread. In some instances, the higher credit rating (and lower interest) is necessary to avoid state-imposed usury ceilings. In the final analysis, rate savings acquired through third party support of higher quality debt has the effect of broadening the market of capital sources.

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V-G. DIRECTION OF THE AIRLINE INDUSTRY -- NEW CARRIERS

The domestic airline industry will be marked by a fragmented structure with a significant number of smaller specialized carriers profitably filling specific market niches not inconsistent with the existence of larger carriers. Rationalization will come to the airline industry. No longer will the carriers try to be all things to all people. The airlines now have the ability to drop routes that are inherently unprofitable because of fleet composition, unique cost structure, or other valid business reasons. To abandon an unprofitable operation is no longer a sign of weakness but a sign of strength to earn an acceptable return on investment.

There are very little, if any, economies of scale in the airline business with the exception of the power of a well-known brand name, according to Dan Colussy of Columbia Air. For this reason, smaller carriers can effectively compete with the larger carriers provided that they can maintain a cost structure substantially below that of the larger ones.

The crisis of confidence in the airline industry should not be applied to the industry as a whole. There are some bad apples but the whole barrel is not rotten. No longer will lenders and investors permit management to make uneconomical business judgments as they have in the past. It is these name carriers which weakened the entire industry with below break-even price tactics.

With profit pressures being applied to the older carriers to drop unprofitable routes, opportunities are opening up for the smaller carrier.

APPENDIX VI

GLOSSARY OF TERMS

## GLOSSARY OF AIRLINE INDUSTRY TERMS

### Air Freight Forwarder

Serving a dual role, the air freight forwarder is, to the shipper, an indirect carrier, so classified because he receives freight from shippers under his own tariff, usually consolidating it into larger units which he tenders to the airlines. To the airlines, the air freight forwarder is a shipper.

### Airline Deregulation Act of 1978

Legislation signed into law in October 1978, that provided for the gradual economic deregulation of the domestic passenger airline industry to be completed by January 1, 1985. The regulation of air cargo was eliminated in 1977.

### Air Transport Association of America (ATA)

The trade and service organization for the U.S. scheduled airlines. ATA acts on behalf of the airlines to serve the government and the public in activities ranging from improvement in air safety to planning for the airlines' role in national defense.

### All-cargo Carrier

One of a class of scheduled airlines holding certificates of public convenience and necessity, issued by the CAB, authorizing the performance of scheduled air freight, express, and mail transportation over specified routes, as well as the conduct of nonscheduled operations which may include passengers.

### All Services

Scheduled plus nonscheduled, or charter, services.

#### Available Seat-Miles (ASMs)

An available seat-mile is one seat flown one mile. For an airline's total system, available seat-miles are the sum of the seat-miles flown by all aircraft. It is a measure of an airline's total passenger capacity.

#### Available Ton-Miles (ATMs)

An available ton-mile is one ton of capacity flown one mile. For an airline's total system, available ton-miles are the sum of all-ton-miles flown by all aircraft. It is a measure of an airline's total capacity.

#### Block Hours

The time of a flight including taxiing time at airports. Measured from when the wheel blocks are removed to when they are replaced at the next airport.

#### Block Speed

The average speed over a flight stage as measured by the stage length divided by the block hours.

#### Break-even Passenger Load Factor

The point at which the percentage of seats occupied results in revenues equaling expenses.

#### CAB (Civil Aeronautics Board)

The CAB is an independent regulatory agency of the Federal government that regulates carrier operations, including rates, routes, operating rights, and mergers. As a result of the passage of the Airline Deregulation Act of 1978, it is scheduled to be phased out of existence by January 1, 1985.

#### Combination Aircraft

An aircraft capable of transporting both passengers and cargo on the same flight. Some cargo is carried on virtually all scheduled passenger flights -- normally in the belly pits below the passenger cabin.

### Commuters

A carrier which does not operate large aircraft and performs at least five round trips per week between two or more points and publishes flight schedules that specify the times, days of the week, and places between which such flights are performed, or transports mails by air pursuant to contract with the United States Postal Service.

### Cruise Speed

The average speed of an aircraft during the cruise portion of the flight profile.

### Deadheading

Movement of aircraft or airline personnel which does not generate passenger revenue, but which is necessary for positioning the aircraft or employees to more useful locations.

### Departures

The act of an aircraft departing from an airport.

### Direct Operating Costs —

Also called aircraft operating costs. Includes all expenses directly related to flight operations; for example, cockpit crew salaries, fuel, insurance, direct aircraft maintenance, and depreciation and amortization. It does not include cabin costs (food and flight attendants), sales and promotion costs, and the like.

### Domestic Operations

In general, operations within and between the fifty states. As of January 1981, includes service between the United States and Puerto Rico and the Virgin Islands.

### Enplanements

The total number of revenue passengers boarding aircraft in scheduled service, including originating, stopover, and connecting passengers.

### Equivalent ATMs, ASMs, RTMs, RPMs

Since freight traffic and capacity are measured in ton-miles while passenger traffic and capacity are measured in passenger miles, respectively, it is difficult to aggregate freight and passenger statistics. Calculating equivalent RTMs is a way to overcome this problem by converting passenger traffic into its tonnage equivalent, thus allowing aggregation of freight and passenger data.

### FAA (Federal Aviation Administration)

The FAA has a dual role in civil aviation. It is responsible for promulgation and enforcement of safety regulations, and it is responsible for the promotion of civil aviation, including aviation research and development. The FAA is also responsible for administering the Federal air traffic control system.

### Flight

The movement of an aircraft from origin to final destination which may or may not involve intermediate stops.

### Flight Equipment

Airframe, aircraft engines, and other flight equipment used in the in-flight operations of aircraft.

### Frequency

The number of flights between two cities in a given period of time, or the number of flights per day or month, etc.

### Hop Length

The airport-to-airport distance of a nonstop flight segment from takeoff to landing.

### Hub and Spoke

A pattern of airline service which links outlying communities to a central hub airport. Hub and spoke flights are often arranged to match the collection and distribution of passengers from a number of spoke communities so that connections to cities beyond the hub are facilitated.

### Interline

The transfer of passengers from one airline to another as part of a simple journey.

### International Air Transport Association (IATA)

The trade and service organization for airlines of more than 100 countries serving international routes.

### International Civil Aviation Organization (ICAO)

The international aviation organization of governments, ICAO is an agency of the United Nations. It was organized to insure orderly worldwide technical development of civil aviation.

### International Operations

In general, operations outside the fifty states, including operations between the United States and foreign countries. As of January, 1981, excludes service between the United States and Puerto Rico, and Virgin Islands.

### Majors

A new grouping, effective January, 1981, by the CAB of large U.S. scheduled airlines used for statistical and financial data aggregation. It includes those carriers with annual revenues of \$1 billion or more.

### Nationals

A new group of certificated carriers, effective January, 1981, consisting of carriers with annual revenues of \$75 million to \$1 billion.

### Nonscheduled Service

Revenue flights, such as charter flights, that are not operated in regular scheduled service.

### Operating Revenue

Revenues received from total airline operations, both scheduled and charter, including passenger, cargo, excess baggage, and certain other transport-related revenue.

### Passengers

The number of originating revenue passengers.

### Potential Seat Miles

Calculated as the maximum ASM which could be generated if aircraft were configured at the highest observed seating density and flown at the highest reasonable utilization rates.

### Regionals

Effective January, 1981, regionals are all certificated (noncommuter) carriers with less than \$75 million in annual revenues.

### Revenue Passenger Load Factor

The percentage of seating capacity that is actually sold and utilized. Computed by dividing revenue passenger-miles by available seat miles.

### Revenue Passenger-Mile (RPM)

One revenue passenger transported one mile. The sum of such RPMs is the customary measure for total airline passenger traffic.

### Revenue Ton-Miles (RTMs)

Tons of revenue traffic (passengers, freight, mail, and express) multiplied by the miles the traffic is flown. RTMs are the customary measure of freight traffic and mail traffic.

### Scheduled Service

Transport service operated over the routes of a U.S. scheduled airline, based on published flight schedules, including extra sections.

### Stub End

Continuation of a flight beyond one destination to another city nearby, for the purpose of increasing traffic on the long-hand portion of the flight.

### System

The total operations of a carrier or carrier grouping (domestic and international operations).

### Trip Length

The combined total of airport to airport distances from a passenger's origin to final destination.

### U.S. Scheduled Airlines

Air carriers holding certificates of public convenience and necessity, issued by the CAB, authorizing the performance of scheduled air transportation over specified routes and a limited amount of nonscheduled operations.

### Utilization -- Average Hours Per Day

Revenue aircraft block hours divided by aircraft days assigned service on carrier routes.

### Warsaw Convention

A multilateral convention which regulates in a uniform manner the conditions of international transportation by air. Among other things, it established the liability of the air carriers.

### Yield

Revenue per passenger-mile or per ton-mile.

APPENDIX VII

CURRENT FINANCIAL METHODS -- April, 1982

CONFERENCE REPORT: AIRCRAFT  
FINANCING METHODS, April 26-27, 1982

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## VII-A. INTRODUCTION

The second annual Aircraft Financing Methods Conference was held on April 26 and 27, 1982 in New York City. Approximately 350 persons attended, primarily representing domestic and foreign financial institutions (bank and non-bank), aviation equipment manufacturers, airlines, and other related industries. Speakers included executives from the airlines, manufacturers, banks, leasing companies, trade associations, and legal and accounting firms.

This appendix summarizes the proceedings of the conference and focuses on those issues related to this project. The general topics covered in this appendix include aircraft financing methods, lenders' criteria, new equity investment, profitability, leasing, and new carriers. These subjects are discussed in relation to the current conditions and future needs and requirements. It should be noted that the conference was held in April, 1982 and reflects the views and opinions of the conference speakers at that time. This is especially important regarding leasing implications -- at that time, the controversy over safe harbor leasing was unresolved, limiting the discussion on this subject. The speakers frequently referred to performance and conditions of various segments within the airline industry, not all of which are comparable with one another. Thus, references to worldwide certificated airlines cannot be equated to U.S. certificated airlines, nor can the latter be interpreted as domestic major airlines or domestic trunk airlines.

The views and opinions contained in this Appendix are those presented by the conference makers and not necessarily those of the authors of this report. Furthermore, representatives did not necessarily claim to be speaking for their respective industry (i.e., bankers for banks, leasing company

executives for lessors) nor did they claim to express the opinions of their institutions.

## VII-B. OVERALL IMPRESSIONS

1982 will be a transition year for the U.S. airlines characterized by:

- turnaround from economic downturn to expansion which could provide renewed strength in air travel supported by tax cuts and the surfacing of pent-up demand for air travel
- an end to price-war strategies to result in improved yields
- continued airline cost control marked by labor concessions and more productive management
- change in objectives from market share to profitability
- continued adaptation to a deregulated environment with respect to routes, equipment, product, financing, and fares.

Investment bankers stated that this transition could result in the elimination of up to three or four major airlines. Because the stakes are so high, the process of rationalization could drag out with the impact more severe than it should be. Traditional lenders, banks, and insurance companies do not like to admit to making a mistake by writing off bad loans. To avoid this, lenders will restructure loans and forgive interest, thereby subsidizing an ailing airline and giving it an advantage over other airlines having to cope with their debt burden.

A KLM executive estimated that by the end of 1981 capacity overhang was nearly ten percent of the capacity of the world's scheduled airlines. With low growth in traffic, this overhang could satisfy four years' growth. The decline in traffic growth, the record poor financial performance, and the crippling debt loads are forcing the airlines to reassess new equipment plans. These capital investment decisions are filled with new uncertainties in the deregulated environment: for the first time, airlines are entering a new-generation jet age without the route franchise. The dilemma they face in

the investment decision process stems from their limited ability to finance new equipment which, over the long run, they require to survive as a viable element in the air transport industry.

The conference speakers generally agreed that the outlook for financing in the 1980s is marked by several key issues: capital structure, profits and equipment programs. More specifically, the airlines must:

- strengthen the financial structure by increasing equity capitalization and reducing debt load
- change business strategy to focus on returns rather than market share
- re-evaluate pricing strategies
- improve operating and net profits
- reassess equipment inventory and requirements under weak and strong traffic assumptions
- develop innovative financing techniques

A recurring theme among conference speakers was that access to capital markets exists for some carriers, not all carriers, and then not always at acceptable prices. Bankers expressed the opinion that those with especially weak balance sheets may be kept alive by their lenders who are motivated more by the threat of failure than by confidence in the airline. Those carriers with stronger balance sheets will be forced to search out new sources of money using new instruments. Examples of these are foreign financings; new hybrid instruments with debt and equity characteristics; risk-limiting strategies involving foreign-exchange exposure, interest-rate insurance; residual-value insurance; individual and employee financing participation; interairline investment and equipment sharing; supplier and foreign (state) bank financing. To make some forms possible, credit ratings of more traditional instruments could be improved by obtaining bank guarantees or letters of credit. Because

of poor operating performance and the airlines expansionary strategies of the 1970s, no mention was given to the industry's ability to finance the new jet age out of internally generated funds which, by the end of 1981, provided only about 35 percent of capital needs.

In the final analysis, if the airline industry is to be strengthened in the long run, then new equipment programs are justified. But financial commitments must be made early, perhaps when the carrier does not exhibit such strength. To obtain financing, the airlines need to improve their equity capitalization and profitability at a time when the overall industry outlook for external funds is not favorable.

## VII-C. TRENDS IN AVIATION FINANCING

### A. Traditional Sources of Funds

Even prior to the 1981 Tax Act changing U.S. leasing rules, lease financing generated the most excitement in the airline industry in recent years. Trunk airline lease financing increased nearly 150 percent from 1979 to 1980 and over 50 percent from 1980 to 1981, reaching over \$1 billion in 1981. The future for lease financing is unclear, primarily due to the issues over residual values. Residual value takes on even greater importance when the transferability of tax benefits declines. If tax benefit transfers (TBTs) are lessened, residual values will receive greater attention at a time when the used equipment market is weak.

Private placements have been declining in size since 1977, reaching a seven year low in 1981 of about \$13 billion. Private placements are long-term debt not sold on the public market but sold directly to insurance companies, pension funds, etc. Because of changes within the insurance industry, funds formerly available to airlines are no longer there.

### B. The Current Environment for Airline Financing

Airline financing has become difficult due to the industry's cyclical and capital intensive nature. In domestic capital markets, airlines compete with higher earning industries as well as foreign airlines which are perceived as being less risky than their domestic counterparts due to foreign government support and/or loan guarantee. Inflation wreaked havoc, increasing the cost of new equipment. The energy crisis caused fuel prices to increase from 12.2 percent of total operating costs in 1973 to 31.5 percent in the second quarter of 1981. Deregulation introduced competition from low cost carriers and

brought major price discounts. When the airlines entered the deregulation era, it was with a strategy geared towards wide body aircraft which were built for the competitive atmosphere of the pre-deregulation era.

The airlines participate in capital markets which are themselves in turmoil. These markets are becoming increasingly international in character and tend to be more sensitive to inflation, exchange rate fluctuation, and interest rates. Borrowing long-term at fixed rates has virtually become eliminated. Lenders suffering huge portfolio losses are becoming more selective, causing firms with a credit rating below Baa to worry about capital availability.

The current situation for new financing is not favorable. The airlines have poor credit ratings (only Delta and Northwest are of "A" quality). Institutional lenders now feel they have too large a portion of their portfolios invested in airline debt. Estimated aircraft orders of \$70 to \$75 billion must be financed by an industry (total certificated) in which:

- Internally generated funds provide less than 40 percent of needs
- Current ratio less than 0.9
- New equity of \$500 million compares with new long-term debt of \$4 billion
- Shareholders receive little if any dividends
- Equity base of \$8.1 billion supports \$11.2 billion of debt
- Operating losses exceeded \$400 million in 1981.

Because of the industry's high degree of leverage -- regarded as too high for an unregulated industry -- the airlines are forced to improve their equity base while at the same time fund new equipment purchases. Changes in the

airlines' operating environment make this risky debt load even riskier. Insurance companies, once an important and traditional source of funds, have changed their investment strategy to focus on real estate; in fact, insurance companies have a smaller pool of funds to invest due to the decline in the sale of whole life insurance. Certain types of aircraft (especially the 727-200 and DC-10) are seen by some lenders and lessors as a bad risk because their useful economic lives are nearly ended, thus not providing sufficient collateral value. Even secured financing via Equipment Trust Certificates (ETC) or leveraged leases (debt portion) is now difficult; the other side of leveraged leasing -- equity portion -- is brought into question largely because of limited taxable income that traditional buyers have to shelter. The ACRS depreciation method introduced in the 1981 Tax Act had the effect of reducing equity funds for (leveraged) leasing from conventional sources because of the increased shelter available per dollar of investment in nonleveraged leasing.

#### C. Financing Strategies for the 1980s

Airline financing in the 1980s will be increasingly difficult according to the conferees. Fleet planning will depend not only on operating/marketing considerations but on financing availability. The financing may be tied to acquisition of certain types of aircraft which may conflict or constrain fleet plans. Thus the financing strategies will be developed around the marketing and operating strategies. Henry Miller of Lehman Brothers Kuhn Loeb and Matthias Bowman of Merrill Lynch White Wild Capital Markets Group outlined some of the objectives which the airlines will have to adopt in developing their financing strategies:

- Diversify capital sources, both geographically and generically. American Airlines went to the Euromarket last year in part to reduce its dependence on U.S. capital markets and to develop new creditor relationships.
- Move to link debt and equity instruments beyond the traditional convertible bond; emerging forms of this are the "equity kicker" to bonds in which lender shares in a fixed percentage of residual value at sale; or, equity notes, similar to convertible bonds but with a higher conversion premium which is an obligation, not an option.
- Finance "opportunistically" -- To obtain funds when favorable market conditions exist even if funds are not immediately required. U.S. Air successfully implemented an opportunistic strategy.
- Pursue (equipment) opportunities which have been largely ignored due to pride, prestige or air transport treaties. Examples are the shared use of aircraft (e.g., Eastern and Air Canada, Air Florida and some European carriers) through counter-seasonal leases; blocked-time agreements and through plane arrangements. All of these may require some "standardization" of aircraft design and fittings.
- Increase the use of employee equity participation via profit sharing plans, ESOPs, etc. in which employees have a direct equity stake in their airline and can benefit in profits. The potential for cost savings, productivity gains and equity capital follow if the employees have a vested interest.
- Employ lower-cost used aircraft and/or retrofit existing aircraft. Financing arrangements are possible for used DC-10-30s involving long-term leases and loans provided by selling airlines.
- Improve efficiency of older and less costly aircraft rather than buying the newer and more expensive models off-the-shelf at a capital cost of \$200,000 or more per seat. For example, a retrofit program for the DC-8-60 involves a cost of about \$60,000 per seat to upgrade and re-engine; the original capital cost about 10 years ago was \$40,000 per seat but most are now fully depreciated. Consideration is also being given to re-engineering the wide body L-1011. The idea of retrofitting could also be adapted to other types of aircraft including the 727-200. By 1985, it is estimated that there will be over 900 727-200s worldwide which will have less than 40,000 flight hours; a major retrofit to provide at least 10 more years of active service could be justified at a projected cost of \$10-12 million per aircraft (current dollars) according to Henry Miller. To control capital expenditures, especially for those airlines not sufficiently strong to purchase the new 150-seat planes (Boeing 777 or Airbus A-320), a retrofit program for older aircraft may be a viable alternative. Although these aircraft have a higher fuel cost per seat mile than the newer more efficient aircraft, the capital cost of an older plane may be near or fully depreciated, offsetting the fuel charge.

- Increase the use of supplier and foreign government financing. Airframe manufacturers traditionally resisted financing clients or supporting extension of credits by third parties. But they may be required to assist certain clients with funds, guarantees or stock subscriptions. Foreign export credits have not been utilized to any large extent by domestic airlines in the acquisition of non-U.S. manufactured aircraft. Foreign export credits and guarantees generally have the effect of lowering the financing costs. An increased use of this type of financial aid would demonstrate that total cost is the relevant measure (as opposed to purchase price). Recent moves by Pan Am in placing ETC guaranteed by the British ECGD which financed the L-1011-500 with Rolls Royce engines and Eastern's purchase of the Airbus are examples of favorable financing through foreign equipment purchases.
- Explore new forms of double dip leasing.<sup>1</sup> Further double dipping mitigates an airline's exposure in dollar liabilities and takes advantage of the spread between dollar and foreign currency's interest rates especially when there is foreign denominated revenue which hedges liabilities in that currency. Even with the change in U.K. write-down allowances (tax shelter), there is an average 100 basis point advantage (one percent) to double dipping over traditional leasing.
- Expand equity base, especially through inter-airline "quasi-equity" investment. Foreign carriers are "linking" with U.S. carriers, although U.S. law limits foreign ownership. Air Florida, in connection with a sale and lease of used aircraft to Emerald Air (a Texas-based cargo airline), took back equity ownership in Emerald. Similarly, Air Florida took a minority interest with LACSA (Costa Rican Airline), providing a Latin American advantage and other operational savings.
- Invent strategies to attract individual investors to finance equipment. This could be accomplished through use of residual value insurance, offered by Merrill Lynch which insures the residual value of an aircraft after the lease term; this mechanism is costly over a longer-term lease (ten to fifteen years) but most attractive in a short-term operating lease.
- Limit exposure on floating rate debt by playing the futures market or buying interest rate insurance. Insurance provides the best of both worlds by covering against increases in rates but allowing the insured to benefit if rates fall. The futures exchange locks the buyer in at current rates, thus benefiting if rates increase and losing if rates decline in the future.

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<sup>1</sup> Double-dip leasing refers to those foreign-to-foreign lease transactions which maximize available tax benefits of both countries. Originally, "double dipping" was applied to leases the UK and another country in order to make use of the UK 25% write-down allowance which is now at ten percent.

New external capital will be available in the 1980s but 1) only to more credit worthy airlines, 2) through nontraditional sources and arrangements, 3) in an increasingly broad international market, and 4) with extensive competition.

AIRCRAFT FINANCING METHODS

a two day Conference at the

PLAZA HOTEL, NEW YORK CITY

on April 26 and April 27, 1982

CHAIRMAN: John C. Emery, Jr.  
Chairman and Chief Executive  
Officer  
Emery Worldwide

CO-CHAIRMEN: Robert Hawkins, Chairman  
Airfinance Journal, Ltd.,  
England

Tore Steen, President  
Emery Financial Services, Inc.,  
Greenwich, Connecticut

P R O G R A M

DAY ONE

Monday, April 26, 1982

9:00 AM Registration

9:30 AM Opening Remarks by Chairman

SUPPLY AND DEMAND:

9:45 AM TRENDS IN AVIATION FINANCING  
Matthias B. Bowman, Managing Director, Merrill  
Lynch White Weld Capital Markets Group, New  
York.

10:15 AM DEVELOPMENTS IN AVAILABILITY OF DIFFERENT  
INSTURMENTS  
Henry S. Miller, Managing Director, Lehman  
Bros Kuhn Loeb, New York.

10:45 AM Questions

11:05 AM Coffee

11:30 AM ASSET CONSIDERATIONS  
Douglas C. Kay, Executive Vice President, GATX  
Leasing Corp, San Francisco

12:00 NEW FINANCING TECHNIQUES  
John C. Pope, Vice President and Treasurer,  
American Airlines, Inc., Dallas, Texas

12:30 PM Questions

12:50 PM Break for Luncheon

**LUNCHEON ADDRESS: A TIME FOR CAREFUL  
DECISIONS**

C.E. Meyer, Jr., President and Chief Executive  
Officer, Trans World Airlines, Inc., New York

**INTERNATIONAL FINANCING OPPORTUNITIES:**

- 2:30 PM **THE LENDER'S CRITERIA**  
Gernot H. Reiners, Vice President, Morgan  
Guaranty Trust Company, New York
- 3:00 PM **PREPARING FOR THE FUTURE**  
Emile Beekman, Senior Vice President, KLM,  
Schiphol, Netherlands
- 3:30 PM **Questions**
- 3:50 PM Refreshments
- 4:15 PM **EQUAL OPPORTUNITIES FOR FINANCING**  
J.B.L. Pierce, Treasurer, The Boeing Company,  
Seattle
- 4:45 PM **FLEET LEASING IN THE INTERNATIONAL MARKET**  
Maxwell J. Haworth, Treasurer, Qantas  
Airlines, Sydney, Australia
- 5:15 PM **Questions**
- 5:35 PM **Chairman's remarks**
- 5:45 PM **Cocktail Reception**

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Airfinance Journal, Ltd.,  
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Tore Steen, President  
Emery Financial Services, Inc.,  
Greenwich, Connecticut

## P R O G R A M

### DAY TWO

Tuesday, April 27, 1982

8:30 AM Conference Resumes

### CARRIER PROSPECTS:

8:40 AM PRECONDITIONS OF PROFITABILITY IN THE WORLD  
AIRLINE INDUSTRY  
— Knut Hammaraskjold, Director-General,  
International Air Transport Association

9:10 AM INDUSTRY PROSPECTS  
Julius Maldutis, Vice President, Salomon  
Brothers, New York

9:40 AM Questions

10:00 AM Coffee

### DEVELOPMENTS IN LEASING IN THE U.S.:

10:25 AM TAX AND ACCOUNTING ASPECTS  
Herbert A. Huene, Tax Partner, Coopers &  
Lybrand, New York

10:50 AM LEGAL ASPECTS  
Stephen P. Gottlieb, Partner, Cadwalader,  
Wickersham & Taft, New York

11:15 AM Questions

11:35 AM BUSINESS ASPECTS  
— John W. Dewey, President, Citicorp Industrial  
Credit, Inc., Harrison, New York

12:05 PM Questions

12:15 PM Break for Luncheon

DEVELOPING CARRIERS: FINANCIAL PERSPECTIVES:

1:35 PM RATIONALE FOR NEW CARRIERS

Gordon Linkon, President and Chief Operating Officer, Midway Airlines, Inc., Chicago, Illinois;

Dan Colussy, Chairman of the Board & Chief Executive Officer, Columbia Air, Inc., Baltimore, Maryland

2:15 PM MANUFACTURERS' CRITERIA

Siegfried Hellmann, Senior Vice President, Marketing, Fokker BV

Dr. Jaap Kamp, General Manager, International Corporate Finance, Algemene Bank Nederland NV, Amsterdam, Netherlands

2:55 PM Questions

3:15 PM Refreshments

3:40 PM COLLATERAL VALUES OF COMMUTER AND NEW ENTRANT AIRCRAFT

Jordan Greene, President, Avmark Services, Inc., Miami, Florida

4:05 PM Questions

4:15 PM BEYOND CURRENT PROBLEMS

Dr. George W. James, Senior Vice President, Economics and Finance, Air Transport Association, Washington, D.C.

4:40 PM Questions

4:50 PM Closing Remarks by Chairman

5:00 PM Close

## AIRCRAFT FINANCING METHODS

### List of Delegates

AERO INDUSTRIES INC: Dania, Florida  
Peter E. McKenna, Vice President - Leasing  
AERON AVIATION CORP: Great Neck, New York  
Eldad Ben-Yosef, Vice President - Finance  
AEROSPACE INDUSTRIES ASSOCIATION: Washington, D. C.  
Allen H. Skaggs, Vice President Civil Aviation  
AETNA LIFE & CASUALTY: Hartford, Connecticut  
Alvin E. Taylor, Assistant Vice President  
AIR FLORIDA: Miami, Florida  
Ceaser Alvarez, Senior Vice President for Finance and Administration  
AIR LINE PILOTS ASS. INT'L: Washington, D. C.  
Eileen Betit, Economic Analyst  
AIR VIRGINIA: Lynchburg, Virginia  
Mr. G. E. Van Flymen, Vice President for Finance & Administration  
Mr. Rodney H. Jaeger, President  
AIR TRANSPORT ASSOCIATION: Washington, D. C.  
William M. Hawkins, Vice President Finance & Taxation  
AIR SALE: Maidenhead, Berks  
William R. Pascall, Managing Director  
AIRBUS INDUSTRIE: New York, New York  
Michael W. Kieklak, Marketing Executive  
AIRBUS INDUSTRIE: Paris, France  
Mr. Souchier Philippe, Sales Finance Director  
AIRBUS INDUSTRIE: Blagnac, France  
Mr. Viaro Denis - Vice President Contracts  
ALGEMENE BANK NEDERLAND NV: Chicago, Illinois  
Marvin D. Juliar, Vice President  
Peter Verwoerd, Assistant Vice President  
ALM ANTILLEAN AIRLINES, Curacao, Netherlands Antilles  
Mr. C. O. Yrausquin, President  
Dr. Herman Van Haagen Vice President Finance  
AMERICAN AIRLINES INC: Dallas, Texas  
Bonney Hall, Executive Secretary  
AMERICAN CASA DISTRIBUTERS, INC: Riverside, CA  
John P. McNamara, President  
William L. Pereira, Consultant  
AMERICAN EXPRESS LEASING CORP: New York, New York  
David H. Rentschler, Senior Vice President  
AMERICAN WEST AIRLINES, INC: Phoenix, Arizona  
Michael J. Conway, Senior Vice President - Finance  
ANA LTD - AIR NORTH: Burlington, Vermont  
David R. Robinson, Vice President Finance  
Hal Findlay, General Manager  
ATLANTIC SOUTHEAST AIRLINES, INC: Hapeville, Georgia  
Robert L. Priddy, Vice President - Administration

## AIRCRAFT FINANCING METHODS

### List of Delegates

AVCO LYCOMING DIVISION: Stratford, Connecticut  
Gary E. Atwell, Vice President, Commercial Engine Programs

AVIATION CAPITAL SERVICES CORPORATION: New York, New York  
Bernard J. Herkimer, Chairman

AVIATION FINANCIAL SERVICES PTY. LTD: Sydney, N. S. W., Australia  
Michael R. M. Neil, Managing Director

AVMARK, INC: Washington D. C.  
William V. Costello, Director

AVMARK SERVICES, INC: Miami, Florida  
Larry L. Adair, Vice President

BABCOCK & BROWN: San Francisco, California  
John C. Robinson, Esquire

BANK OF AMERICA NT & SA: New York, New York  
Julia D. Turner, Assistant Vice President

THE BANK OF NEW YORK: New York, New York  
V. L. Van Hise, Vice President

BANKERS TRUST COMPANY: New York, New York  
Arthur J. Bernstein, Vice President  
Linda Ram, Assistant Treasurer

BARCLAYS BANK INTERNATIONAL: New York, New York  
Michael G. K. Post, Vice President  
Nicholas Dunphy, Vice President  
Ray Obrenski, Vice President

BARCLAYS BANK INTERNATIONAL LTD: New York, New York  
Howard L. Aller, Vice President

BARCLAYS MERCHANT BANK LTD: London  
T. S. Jones, Group Aerospace Executive

BELL, COWARD, MORRISON & SPIES: Lynchburg, Virginia  
Curtis M. Coward, Attorney

BENEFICIAL FINANCE LEASING CORP: New York, New York  
Gerald R. Nocera, Senior Vice President  
Ingo K. Kozak, Controller

BRISTOL ASSOCIATES: Washington, D. C.  
Pete Seidlitz, General Partner

BRITISH AEROSPACE, INC: Washington, D. C.  
Anthony R. Ennis, Director of Contracts-Aircraft

BRITISH AEROSPACE PLC: Manchester, England  
S. O'Sullivan, Contracts Executive  
Mr. D. G. Griffiths, Contracts Manager

BRITISH AEROSPACE PLC: Weybridge, United Kingdom  
Mr. J. D. Hanson, Treasurer

BRITISH AEROSPACE: Kingston-upon-Thames, United Kingdom  
Mr. D. A. Langfield, Executive Director - Export Finance

BRITISH AEROSPACE PLC: Hatfield, Herts., United Kingdom  
Mr. D. R. Shelley, Commercial Manager

## AIRCRAFT FINANCING METHODS

### List of Delegates

BUTCHER & SINGER, INC: Philadelphia, Pennsylvania  
Don Bready, Manager, Aircraft Leasing  
John Seal, Senior Vice President

C. A. L. CARGO AIR LINES LTD: Tel-Aviv, Israel  
Safirir Nelkin, President

CANADAIR LIMITED: Montreal, Canada  
Sean O'Brien, Assistant Treasurer

CANADIAN-DOMINION LEASING CORP. LTD: Toronto, Canada  
Hamish M. Smith, President  
Murray Sutherland, Senior Vice-President, Sales

CANADIAN IMPERIAL BANK OF COMMERCE: Toronto, Canada  
Mr. S. W. Turner, Corporate Finance Officer

CANADIAN IMPERIAL BANK OF COMMERCE: Chicago, Illinois  
Diane E. Goren, Manager, Corporate Finance Group - USA

CHALLENGE AIR TRANSPORT, INC: Miami, Florida  
B. F. Spohrer, President

CHARTERMASTERS INC: Ontario, Canada  
Kevin Rofe, Managing-Director  
Gary A. McCulloch, Accountant

CHASE COMMERCIAL CORPORATION: Englewood Cliffs, New Jersey  
Douglas E. Weltz, Vice President Marketing

THE CHASE MANHATTAN BANK, N. A: New York, New York  
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John E. Kocor, Vice President  
Philip H. DeFord, Vice President  
Peter M. Foggin, Second Vice President  
Robert E. Lewis, Second Vice President  
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Carol D. Holmes, Vice President

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Peter L. Geller, Assistant Secretary  
Shafqat A. Khan, Assistant Secretary  
J. A. Guddat, Vice President

CHEMCO INTERNATIONAL LEASING: New York, New York  
Malcolm J. Kimble, Assistant Vice President

CHEMCO INTERNATIONAL LEASING: London, United Kingdom  
Alan Hodder, Vice President

CHEMCO LEASING GMBH, Frankfurt/Main  
J. H. Mathewson, General Manager

CIT CORPORATION: New York, New York  
Stephen M. O'Neil, Assistant Vice President

CITICORP INDUSTRIAL CREDIT, INC: Harrison, New York  
Thomas J. Dwyer Jr., Vice President  
George Umbreit, Vice President

## AIRCRAFT FINANCING METHODS

### List of Delegates

CONNELL FINANCE COMPANY: Westfield, New Jersey  
William T. Guinee, Vice President

CONTINENTAL RANK: Chicago, Illinois  
Mary Gail Fitzpatrick, Banking Officer

CONTINENTAL ILLINOIS LEASING CORP: Chicago, Illinois  
Michael J. Kinney, Vice President  
Ingrid L. Sarapuu, Leasing Officer

CONTINENTAL ILLINOIS NATIONAL BANK: Seattle, Washington  
Douglas S. Hadley, Banking Associate

CREDIT LEASING INTERNATIONAL CORP: New York, New York  
Burt C. Risser, Vice President & Managing Director

CREDIT LYONNAIS: Paris, France  
Pierre-Yves Divisia, Manager Aerospace  
Yves-Marie Quelen, Assistant Manager

CROWE & DUNLEVY: Oklahoma City, Oklahoma  
Preston G. Gaddis II, Attorney

DE HAVILLAND AIRCRAFT OF CANADA CORP: Ontario, Canada  
M. F. Merrithew, Product Marketing Manager  
Walter Craig, Director, Sales Financing

DGA INTERNATIONAL, INC: Washington, D. C.  
David Bronheim, Vice President  
Langhorne Bond, Consultant  
Howard S. Goldberg, Vice President

DLJ CAPITAL CORPORATION: New York, New York  
Edward Sager, Vice President

DOUGLAS AIRCRAFT CO: Long Beach, California  
Carlton J. Nathan, Director-Proposals Management & Marketing Planning  
Carmen Bertino, Director, Commercial Contracts

EASTERN AIR LINES, INC: Miami, Florida  
Rolf S. Andresen, Vice President & Treasurer

EQUILEASE CORPORATION: New York, New York  
Mort Wimpie, Senior Vice President

FAIRCHILD SWEARINGEN: San Antonio, Texas  
David E. Candler, Vice President Financial Services

FEDERAL EXPRESS CORPORATION: Memphis, Tennessee  
Ronald K. Anderson, Director, A/C Acquisitions & Sales

FINALCO AIRCRAFT LEASING INC: McLean, Virginia  
Jon J. Prager, President

FINANSSKANDIC INTERNATIONAL SA, Luxembourg  
Engman Gert, Vice President

FIRST DALLAS LTD: London, United Kingdom  
David Griffiths, Executive Director

FLIGHT INTERNATIONAL, INC: Atlanta, Georgia  
Thomas J. Adair, Vice President & Controller

THE FIRST NATIONAL BANK OF CHICAGO: Chicago, Illinois  
John F. Patek, Assistant Vice President

## AIRCRAFT FINANCING METHODS

### List of Delegates

FOKKER AIRCRAFT U. S. A., INC: Arlington, Virginia  
Stuart Matthews, President  
FOKKER BV, Netherlands  
Dr. B. Wilschut, General Manager of Aircraft  
GALLAND, KHARASCH, CALKINS & SHORT, P.C: Washington, D. C.  
Morris R. Garfinkle, Esq..  
GENERAL ELECTRIC COMPANY: Cincinnati, Ohio  
Thomas H. Flood, Manager-Customer Sales Financing  
J. V. R. Doyon, Manager - CEO Financing & Administration Operation  
Thomas E. Wilson, Marketing Manager  
GENERAL ELECTRIC CREDIT CORP: Stamford, Connecticut  
Richard M. Baudouin, Manager, Air Financing  
Wynn Plaut, Marketing Representative  
GREYHOUND LEASING & FINANCIAL CORP: Phoenix, Arizona  
William J. Tamme, Financial Analyst, International  
GENERAL REINSURANCE CORP: Greenwich, Connecticut  
Donald Waggoner, Assistant Vice President  
GRINDLAYS BANK PLC: London, United Kingdom  
C. W. Poole, Senior Manager  
T. C. W. Ingram, Director  
GUINNESS PEAT MIDLAND LTD: Shannon, Ireland  
Robert Blanchett - Managing Director  
Colm Barrington, Managing Director ( Designate)  
GEO-ENERGY LIMITED: Philadelphia, Pennsylvania  
Thomas F. Bole, Vice President  
HAIGHT, GARDNER, POOR & HAVENS: New York, New York  
Robert B. Haserot, Partner  
HEATHER LEASING CORPORATION: New York, New York  
Robert E. Whitehead, Executive Vice President  
HILL SAMUEL & CO. LTD: London, United Kingdom  
D. J. E. Longridge, Manager  
IBL COMPUTERS LTD: Ascot, United Kingdom  
George Rozwadowski, Leasing Executive  
INGERSOLL-RAND FINANCIAL CORP: Montvale, New Jersey  
James M. Vandervalk, Director-Lease Financing  
INSURED AIRCRAFT TITLE SERVICE: Oklahoma City, Oklahoma  
Mary Miller, Vice President  
INTEGRITY AIRCRAFT SALES INC: Ft. Lauderdale, Florida  
Byron G. Ellison, Executive Vice President  
INTERNATIONAL AVIATION DIVISION: New York, New York  
Robert P. Runk, Senior Vice President  
INTERNATIONAL LEASE FINANCE CORP: Beverly Hills, California  
Keith G. Sutton, Funding Manager  
Richard A. Glenn, Project Consultant  
Louis L. Gonda, Executive Vice President  
Alan H. Lund, Vice President Finance

## AIRCRAFT FINANCING METHODS

### List of Delegates

INTERNATIONAL AIR LEASES, INC: Miami, Florida  
Harry M. Weisberg, Executive Vice President  
INTERNATIONAL EXECUTIVE AIRCRAFT CORP: Purchase, New York  
Dennis Germaske, President  
INTERET, DIVISION OF GRI, INC: Philadelphia, Pennsylvania  
John P. Hakemian, President  
I. P. SHARP ASSOCIATES: Rochester, New York  
Fletcher McTaggart, U. S. General Manager  
ITT INDUSTRIAL CREDIT: Great Neck, New York  
Eugene F. Clark, Regional Manager  
JANNEY MONTGOMERY SCOTT INC: Philadelphia, Pennsylvania  
Jeffrey P. Price, Vice President  
JOHN HANCOCK MUTUAL LIFE INSURANCE CO: Boston, Massachusetts  
Evans R. Whilby, Investment Officer  
JONES, WALDO, HOLBROOK & McDONOUGH: Salt Lake City, Utah  
Roy Williams, Attorney  
KANEMATSU-GOSHO LTD: Tokyo, Japan  
A. Shibuya, Manager, Aircraft Department  
KEMPER FINANCIAL SERVICES: Chicago, Illinois  
Michael A. McNamara, Associate Director of Research  
KG ALLGEMEINE LEASING: GMGH: Munchen, West Germany  
K. Fohlmeister, Managing Director  
LEASE FINANCING CORPORATION: Radnor, Pennsylvania  
James C. Ebbert, Assistant Vice President  
LLOYDS BANK INTERNATIONAL LIMITED: New York, New York  
A. M. Cutler, Vice President  
LLOYDS BANK INTERNATIONAL: London, United Kingdom  
Tony Denny, Manager, Aircraft Finance  
LOCAFRANCE: Paris, France  
Yves Guerin, Directeur Adjoint  
LOCKHEED-GEORGIA COMPANY: Marietta, Georgia  
F. L. Rooney, Advanced Program Plans  
MAGNUM ACCEPTANCES LTD: Marshalltown, South Africa  
Jannie C. Fick, Director  
MANUFACTURERS HANOVER LEASING: New York, New York  
Mark Zucker, Vice President  
John L. O'Bryan, Leasing Officer  
Virginia S. Clark, Project Finance Officer  
Marlou Castillo, Assistant Credit Manager  
Robert Saunders, Senior Leasing Officer  
MARINE MIDLAND BANK, N. A: New York, New York  
Charles P. Mancuso, Vice President

AIRCRAFT FINANCING METHODS

List of Delegates

MATRIX LEASING INTERNATIONAL INC: San Francisco, California  
Harold K. Criswell, President

MCDONNELL DOUGLAS FINANCE CORP: Long Beach, California  
Thomas C. Moore, Assistant Vice President

MELLON BANK N. A: Pittsburgh, Pennsylvania  
Ernest C. Roessler, Vice President

MERRILL LYNCH LEASING: New York, New York  
Roy Johnson, Associate  
Sandra A. Hodala, Transportation Financing Division  
Doug Carleton, Senior Associate  
Stephen Bodurtha, Associate

MIDLAND BANK LTD: London, United Kingdom  
W. A. Cooper, Senior Executive  
B. E. Nottle, Manager

MINET LEASING SERVICES LTD: London, United Kingdom  
R. P. Maughan, Managing Director  
P. D. Conroy, Director

MORGAN GRENFELL INC: New York, New York  
David Henderson, Vice President

NCR CORPORATION: Dayton, Ohio  
Victor M. Hansen, Manager, Business Planning, Transportation Systems

NATIONAL BANK: New York, New York  
Howard Mathiasen, Vice President

NATIONAL LEASING & FINANCE CO: London, United Kingdom  
H. E. Kitchner, Director  
D. Altschuler, Director

NATIONAL WESTMINSTER BANK: London, United Kingdom  
I. R. Buddell, Manager - Aerospace Section

NEW ENGLAND MERCHANTS LEASING: Boston, Massachusetts  
Dennis Hanlon, Group Manager

NEW ENGLAND MERCHANTS NATIONAL BANK: Boston, Massachusetts  
Michael P. Hart, Assistant Vice President

NISSHO IWAI AMERICAN CORP: Los Angeles, California  
Yoji Nobunaga, Vice President, Manager, Machinery Department  
K. Sotsuka, Manager, Aircraft Department

NORTON ROSE BOTTERELL & ROCHE: London, United Kingdom  
Sarah Holt, Solicitor

ORION AIRWAYS LTD: Donington  
R. Muckleston, Chief Executive

PHILIPPINE AIRLINES: Manila, Philippines  
Rafael Igoa, Executive Vice President

PKFinans: Stockholm, Sweden  
Lars Isaksson

PRATT & WHITNEY AIRCRAFT: East Hartford, Connecticut  
Chatherine M. Banbury  
James E. Hunt, Marketing Account Manager

## AIRCRAFT FINANCING METHODS

### List of Delegates

QUANTUM ACCEPTANCES LTD: Johannesburg, South Africa  
Don Meyer, Director

ROLLS ROYCE INC: New York, New York  
E. H. Burgess, Senior Vice President Marketing

ROLLS ROYCE LTD: London, United Kingdom  
R. W. Overton, Manager Customer Finance

R. P. MARTIN LEASING LTD: London, United Kingdom  
Peter Jasilkowski, Managing Director  
W. D. Ashcraft, Director

S. G. WARBURG & CO. LTD: London, United Kingdom  
D. M. M. Beever, Senior General Manager

SAS: Bromma, Sweden  
Hans E. Westerstad, Director Corporate Insurance & Legal Affairs

SARELCO: Belgium  
Mr. Karelle

SEATTLE-FIRST NATIONAL BANK: Seattle, Washington  
Sibrand S. Jurriaans, Vice President

SECURITY PACIFIC INTERNATIONAL LEASING: Paris, France  
Maxime Sadowsky, Vice President

SECURITY PACIFIC LEASING: London, United Kingdom  
Michael Percy, Assistant Vice President

SECURITY PACIFIC NATIONAL BANK: London, United Kingdom  
J. E. V. Rose, Assistant Vice President

SECURITY PACIFIC INTERNATIONAL LEASING: London, United Kingdom  
I. Levack, Senior Vice President

SHALA - SERVICES FOR AGRICULTURE LTD: Tel Aviv, Israel  
Israel Efrat, Chairman of the Board

SHORTS AIRCRAFT: Arlington, Virginia  
A. Oakley Brooks, Jnr., Vice President Marketing

SIKORSKY AIRCRAFT: Stratford, Connecticut  
Douglas Halley, Chief New Product - Evaluation  
Charles J.O'Leary, Jr.  
Robert Bitar

SHORTS AIRCRAFT: Arlington, Virginia  
A. Oakley Brooks, Jnr., Vice President Marketing

THE SINGER COMPANY: Binghamton, New York  
John D. Anderson, Director of Sales

SIMAT, HELLIESEN, EICHNER, INC: Waltham, Massachusetts  
Dr. William J. Duffy, Executive Vice President

SNIAS: Paris, France  
Joel le Breton

SOGLEASE CORPORATION: New York, New York  
William Post, Assistant Vice President

## AIRCRAFT FINANCING METHODS

### List of Delegates

STANDARD CHARTERED BANK: New York, New York  
Bryan A. FitzGerald, Executive Vice President

STEINER FINANCIAL CORPORATION: San Francisco, California  
Mark Thickpenny, Marketing Manager  
Jim Mitchell, Vice President Finance

SUPERSONIC EXPRESS CORPORATION: New York, New York  
William A. Good, President

SYNERGY, INC: Washington, D. C.  
Debrah L. Denemark, Financial Analyst

TANON & COMPANY: New York, New York  
Michael J. Jackson, Vice President

THACHER PROFFITT & WOOD: New York, New York  
Stephen T. Whelan, Partner

TIGER EUROPEAN FINANCIAL SERVICES: Paris, France  
Francois Gauchenot, Manager

TIGER FINANCIAL SERVICES: Chicago, Illinois  
John A. Harrison, President  
William Suddath, Director, Aircraft Financing  
George Pawlus, Associate  
Alex Kurland, Associate

TRANS UNION ASSET MANAGEMENT: Foster City, California  
Allen E. Nugent, II, President  
David F. Thompson, Vice President

TRANSAMERICA EQUIPMENT LEASING: San Francisco, California  
Robert D. Myers, Vice President and General Counsel  
Jack Goodman  
Bob Lindberg

TRANSAVIA HOLLAND BV: Netherlands  
A. R. Marx, Vice President  
B. F. Maas, Controller

TWA, INC: New York, New York  
Mary Popper, Senior Attorney

TXL CORPORATION: San Francisco, California  
Mike Buchanan, Executive Vice President

UNION BANK: Los Angeles, California  
Norman S. Coker, Vice President  
Philip H. Selway, Financial Analyst

UNITED TECHNOLOGIES CORPORATION: Hartford, Connecticut  
Stephen Sohn, Manager, Export & International Project Finance

UTA: Puteaux, France  
P. Negre, Vice President - Marketing and Scheduling  
L. Ragoucy, Finance and Control, Vice President

VERNER, LIIPFERT, BERNHARD & McPHERSON, Washington, D. C.  
Michael J. Roberts, Partner

VOLPAR, INC: Van Nuys, California  
Gary G. Harrop, Vice President - Finance  
Steve A. Miller, Attorney  
Mike Grella, Marketing Manager

AIRCRAFT FINANCING METHODS

List of Delegates

WESTINGHOUSE CREDIT CORPORATION: Pittsburgh, Pennsylvania  
Robert L. Heath, Manager, Lease Operations  
WESTLAND PLC: Somerset, United Kingdom  
H. P. Stewart, Group Finance Director  
WILDE SAPTE: London, United Kingdom  
A. S. Miles, Partner  
CHARLES F. WILLIS CO: Seattle, Washington  
Charles F. Willis III, President  
CHARLES F. WILLIS CO: Middlesex, United Kingdom  
M. E. W. Simson, Director - Europe and Middle East  
XEROX CREDIT CORPORATION: Greenwich, Connecticut  
James P. Dugan, Jr., Vice President  
ZUCKERT, SCOUTT & RASENBERGER: Washington, D. C.  
Ralph L. Kissick, Esq.

## AIRCRAFT FINANCING METHODS

### ADDENDUM

AIR PANAMA: Panama  
Desiree Clarence Marueez, Finance Director  
ALITALIA AIRLINES: Rome, Italy  
V.Franco  
AMSTERDAM-ROTTERDAM BANK NV: Amsterdam, Netherlands  
G.Kuijper, Manager  
BABCOCK & BROWN: New York, New York  
Jim Fantaci, Partner  
BANQUE NATIONALE DE PARIS: Paris, France  
Peter Tambosi, Manager, Aerospace Division  
CITIBANK: New York, New York  
Frederick W. Bradley, Senior Vice President  
J. Keith Crews, Vice President  
EMERY FINANCIAL SERVICES: Greenwich, Connecticut  
Roger Pritchard, Vice President  
Louis B. Seibel, Vice President  
Michael J. Gray, Vice President  
EMERY WORLDWIDE: Wilton, Connecticut  
Dennis M. McCarthy, Senior Vice President & Chief Financial Officer  
Richard P. Wooster, Vice President and Treasurer  
Arthur C. French, Jr., Senior Vice President  
Daniel J. McCauley, Vice President  
ICC - INTERNATIONALE COMPUTER & CONSULTANCY GmbH: Hamburg, W. Germany  
Herr Grutke  
Ulrich Schroeder, President  
Herr Fels  
Thomas H.E. Godehus  
I. P. SHARP ASSOCIATES: Toronto, Canada  
Ian Sharp, President  
KLM AIRLINES: Amsterdam, Netherlands  
P. C. W. Alberda van Ekenstein  
LADCEO AIRLINE: Santiago, Chile  
Marcela Bercovich, Finance Vice President  
PRC SPEAS: Lake Success, New York  
William H. Bath, Director, Technical Services  
SPANNO CORPORATION: Melville, New York  
Jerry Silverman, Vice President

\*\*\*\*\*

THE FIRST NATIONAL BANK OF BOSTON: Boston, Massachusetts  
William P. Finan, Vice President  
Paul F. Hardiman, First Vice President  
Patrick T. Kelly, Loan Officer

\*\*\*\*\*

AMRO BANK: Amsterdam, the Netherlands  
Gerben Kuyper - International Corporate Accounts  
BANKERS TRUST COMPANY: New York, New York  
James J. Conroy - Vice President  
BENESCH, FRIEDLANDER, COPLAN & ARONOFF: Cleveland, Ohio  
Thomas Ford - Attorney at Law  
CHASE COMMERCIAL CORPORATION: Englewood Cliffs, New Jersey  
Paula J. Jachno - Second Vice President - Liaison Officer  
CHEMCO INTERNATIONAL LEASING: New York, New York  
John Baring - Vice President  
CITICORP INDUSTRIAL CREDIT, INC.: Harrison, New York  
Jon S. Pospisil - Account Officer  
DEVELOPMENT FINANCE CORPORATION OF NEW ZEALAND: New Zealand  
Richard A. Glenn - Projects Controller  
Keith G. Sutton - Funding Manager  
FIRST INTERSTATE BANK: Los Angeles, California  
D. Paul Nilbarger - Vice President  
FIRST NATIONAL BANK OF BOSTON: Boston, Massachusetts  
Richard H. Hawkins - Assistant Vice President  
John L. Tierney - Assistant Vice President  
IBL (BV)  
J.N. Sharman  
INTERNATIONAL EXECUTIVE AIRCRAFT CORPORATION: Purchase, New York  
William Bond Elliott - Chairman of the Board  
LICO: Madrid, Spain  
Tomas Perez Ruiz - Director General  
NATIONAL WESTMINSTER BANK LIMITED: London, England  
Robert Currie - Senior Manager  
ROCKWELL INTERNATIONAL: Tulsa, Oklahoma  
W.W. Schaefer - Manager  
  
HAPAG-LLOYD FLUG LEGAL COUNSEL:  
Werner Schierk

APPENDIX VIII

BIBLIOGRAPHY

BIBLIOGRAPHY: REGULATORY FRAMEWORK

Airline Deregulation: A Review After Two Years, Melvin A. Brenner Associates, Inc., Rowayton, Conn., 1981.

Availability of Aircraft to Meet the Needs of the Commuter Airline Industry in the 1980s. Hearing Before the Subcommittee on Aviation of the Committee on Public Works and Transportation, House of Representatives, July 30, 1980.

Federal Aviation Administration, Department of Transportation, GPO: Washington, D.C.

Graham, David R., Kaplan, Daniel P., Developments in the Deregulated Airline Industry. Office of Economic Analysis, Civil Aeronautics Board, Washington, D.C., June 1981.

Guide to Federal Aviation Administration Publications, Federal Aviation Administration, Washington, D.C., June, 1981.

Hearings Before the Committee on Commerce, Science, and Transportation United States Senate on the U.S. Commuter Airline Industry, U.S. Government Printing Office, Washington, D.C., February 9 and 12, 1981.

Lenorovitz, Jeffrey, M. "Tariff, Traffic Changes Sought," Aviation Week & Space Technology, pp. 22-26, Nov. 2, 1981.

Ott, James, "Aviation Policy Shift Emerges," Aviation Week & Space Technology, pp. 21-23, Dec. 21, 1981.

Presentation of the U.S. Civil Aeronautics Board Before the Government Activities and Transportation Subcommittee Committee on Government Operations, September 10, 1981.

Presentation of the Civil Aeronautics Board before the Government and Transportation Subcommittee Committee on Government Operations, U. S. House of Representatives, September 10, 1981.

"Senate CAB Sunset Draft Avoids Disputed Issues," Aviation Week & Space Technology, pp. 49, Oct. 5, 1981.

Statement of Marvin S. Cohen, Chairman, Civil Aeronautics Board, Before the House Subcommittee on Aviation, March 3, 1981.

Statement of Marvin S. Cohen, Chairman, Civil Aeronautics Board, Before the House Subcommittee on Aviation, June 18, 1981

Statement of Marvin S. Cohen, Chairman, Civil Aeronautics Board, Before the House Subcommittee on Aviation, July 15, 1981.

Statement of Marvin S. Cohen, Chairman, Civil Aeronautics Board Before the House Committee on Public Works and Transportation Subcommittee on Investigation and Oversight, August 4, 1981.

Statement of Marvin S. Cohen, Chairman, Civil Aeronautics Board Before the Senate Subcommittee on Aviation, July 7, 1981

The Federal Aviation Administration and its Responsibilities, Speaker's Kit, Federal Aviation Administration, Washington, D.C.

The Systems Research and Development Service: Architect of the National Airspace System, Federal Aviation Administration, Washington, D.C.

"U.S. Agency Turns Attention to Post-Sunset Environment," Aviation Week & Space Technology, pp. 170-171, March 8, 1982.

World, Federal Aviation Administration, Vol. 10, No. 8, August, 1980.

BIBLIOGRAPHY: ASSOCIATION FRAMEWORK

Aerospace, Aerospace Industries Association of America, Washington, D.C.,  
Spring 1980.

Aerospace, Aerospace Industries Association of America, Washington, D.C.,  
Fall 1980.

Aerospace, Aerospace Industries Association of America, Washington, D.C.,  
Spring 1981.

Aerospace, Aerospace Industries Association of America. Washington, D.C.,  
Fall 1981.

Aerospace, Aerospace Industries Association of America, Washington, D.C.,  
Winter 1981.

Aerospace Industries Association Organization and Functions, Aerospace  
Industries Association of America, Inc., Washington, D.C.

Aerospace Industries Association, 1980 Annual Report, Aerospace Industries  
Association of America Inc., Washington, D.C. 1981.

Aerospace News, Aerospace Industries Association of America, Inc.  
Washington, D.C., May 19, 1981.

Air Transport Association, Air Transport Association of America, Washington,  
D.C., January 1981.

Budget Estimates, Financial Years 1981, 1982, 1983, Supporting Documentation  
for the Twenty-Third Session of the Assembly, International Civil  
Aviation Organization, Montreal, 1980.

European Civil Aviation Conference, Tenth Triennial Session, Strasbourg, 12-15  
June 1979, Paris, 1979.

IATA Publications and Training Material Available to the Public, June 1981.

Issue Statements, Aerospace Industries Association of America, Inc.,  
December, 1980.

Membership of IATA, International Air Transport Association, Feb. 15, 1982.

Remarks by Karl G. Harr, Jr., President, Aerospace Industries Association  
Before Mid-East Region, Aviation/Space Writers Association.

The Aims and Activities of the International Air Transport Association, IATA.

BIBLIOGRAPHY: AIRLINE INDUSTRY ECONOMICS

- "A Strong Update in Air Fares," Business Week, pp. 94-95, October 5, 1981.
- Air Cargo from A to Z, The Air Transport Association of America, November 1979.
- "Airline Drops 757, Slows 767 Buy," Aviation Week & Space Technology, p. 280, March 8, 1982.
- Air Transport, 1981, Air Transport Association, 1981.
- Air Transport, 1980, Air Transport Association, 1980.
- "American Air Cancels Plans for Boeing 757s," Wall Street Journal, Feb. 26, 1982.
- Aviation Week & Space Technology, International Air Transport Issue, McGraw-Hill, Hightstown, N.J., November 9, 1981.
- Boeing Commercial Airplane Company, Dimensions of Airline Growth, March 1980.
- "Boeing Proposes 747 Version as Cargo Airlift," Aviation Week & Space Technology, p. 24, October 5, 1981.
- Castledine, Susan, "Air Freight, Transport Competition Increasing," Aviation Week & Space Technology, pp. 203-204, March 8, 1982.
- Cavarra, Leslie A., Stover, Roger D., Allen, Benjamin J., "The Capital Market Effects of Airline Deregulation," Transportation Journal, pp. 73-78, Spring 1981.
- Domestic Industry Passenger Demand Forecast, 1974-2000; Trunk and Regional Carriers, Economic Analysis and Forecasting Committee, Air Transport Association of America, September 1975.
- Feazel, Michael, "Pressure of Discounts Clouds Outlook for Yields of Major Airlines," Aviation Week & Space Technology, pp. 186-187, March 8, 1982.
- Feazel, Michael, "United Asks Boeing to Halt Work," Aviation Week & Space Technology, pp. 28-29, April 5, 1982.
- Ghoshal, Animesh, "Price Elasticity of Demand for Air Passenger Service: Some Additional Evidence," Transportation Journal, Summer 1981.
- International Air Travel, Industry Passenger Demand Forecast United States Related Traffic, 1976-2000, Economic Analysis and Forecasting Committee, Air Transport Association of America.

AIRLINE INDUSTRY ECONOMICS (CONTINUED)

International Air Travel: Industry Passenger Demand Forecast, United States -Related Traffic, 1976-2000, Macro Forecast Task Force of the Economics Analysis and Forecasting Committee Air Transport Association of America, Washington, D.C., May, 1976.

James, George W., Airline Economics, Lexington Books, Lexington, Mass., 1982.

Jung, J. M., Fujii, E. T., "For Air Travel Some New Evidence," Journal of Transport Economics and Policy, pp. 157-262, May 1980.

Lockheed - California Company, World Air Traffic Forecast 1980, Report No. FEA/2968, Burbank, Calif., September 1980.

"Lockheed Offers Airlift Alternative," Aviation Week & Space Technology, p.24, September 21, 1981.

Manual on Air Traffic Forecasting, International Civil Aviation Organization, Montreal, Canada, 1972.

Meyer, John R., Oster, Clinton V. Jr., Morgan, Ivor, P. Berman, Benjamin, A, Strassman, Diana L., Airline Deregulation, The Early Experience, Auburn House Publishing Company Boston, Mass., 1981.

Mintz, Morton, "Air Force Memo Says Boeing 747 May Meet Strategic Airlift Needs," Washington Post, April 16, 1982.

O'Lone, Richard G., "Manufacturers See Solid Growth Ahead," Aviation Week & Space Technology, pp. 167-175, March 9, 1981.

Ott, James, "Management, Labor Debate Work Issues," Aviation Week & Space Technology, pp. 30-31, September 7, 1981.

Ott, James, "U.S. Airlines Forecasting Upturn for Late 1982," Aviation Week & Space Technology, pp. 176-179, March 8, 1982.

Pustay, Michael W., "Airline Competition and Network Effects," Transportation Journal, pp. 63-72, Summer 1980.

Rezendes, Vic S., "Airline Deregulation: Boom or Bust?," The GAO Review, Spring 1981.

Steiner, J. E. Commercial Transport Aircraft Trends Present and Future, October 10, 1980.

Straszheim, Mahlon R, "The North Atlantic and their Pricing Implications," Journal of Transport Economics and Policy, pp. 179-195, May 1980.

AIRLINE INDUSTRY ECONOMICS (CONTINUED)

Taneja, Nawal, K, Airline Planning: Corporate, Financial, and Marketing, Lexington Books, Lexington, Mass., 1982.

The Contribution of Air Transportation to the U.S. Economy, Air Transport Association of America, June 1981.

The Contribution of Air Transportation to the U.S. Economy, Economics and Finance Department, Air Transport Association of America, June 1981.

U.S. Airlift Requirements Should Be Satisfied Through Competition, Memo by W. H. Sheley, Jr., Director GAO to Caspar Weinberger, Secretary of Defense, Dec. 18, 1981.

"When the Skies Turn Unfriendly," Business Week, pp. 92-93, March 1, 1982.

Wing's Club Speech by T. A. Wilson, Chairman of the Board, The Boeing Company. Presented to Wing's Club, New York November 18, 1981.

World Air Transport Statistics, International Air Transport Association, June 27, 1980.

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